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This is a final report for year one of a comprehensive epidemiologic research study of a large population of military women and men in an operationally deployed situation, assignment to Naval ships. This study addresses factors affecting the health and performance of women serving aboard ship, utilizing three data collection methods: (1) questionnaires administered aboard ship, (2) sick call visits ascertained aboard ship, and (3) structured discussions with medical department staff. During year one, 38 ships with 6,072 women aboard participated in the survey, 52 ships provided over 35,000 sick call visits, and 37 ships provided medical department interviews. Information collected as of 30 OCT 95 for the first 4,337 shipboard personnel, 21,882 sick call visits, and 36 shipboard medical department personnel were reported. Year one of this study has begun to address the basic questions concerning health and psychosocial aspects of women serving aboard ship during a period of rapid change. The component studies of this project are yielding many important insights into these complex issues. This study is providing interrelated information on a wide variety of topics to insure optimal health and readiness and to facilitate decision making for policy development.

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Frank C. Garland 1/2/96

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ABSTRACT

Purpose. This is a final report for year one (FY 95) of a comprehensive epidemiologic research study of a large population of military women in an operationally deployed situation, assignment to Naval ships. The project is being conducted under the Congressionally established Defense Women's Health Research Program (DWHRP). This study is designed to address aspects of the four major research topic areas specified in an Institute of Medicine Report which provided recommendations for research on the health of military women. These topic areas include factors affecting the health and performance of women serving aboard ship, psychological and health issues resulting from integration of women into a hierarchical male environment, health promotion and disease prevention, and access to and delivery of health care. The objectives of the study include descriptions of the health status, health care utilization patterns, heath care needs, reproductive characteristics, birth control availability and pregnancy-related issues, psychological characteristics, perceived stress, and self-reported occupational and environmental exposures of women assigned aboard U.S. Navy ships and a comparison group of men aboard the same ships.

Methods. This project utilizes three primary data collection methods: (1) a questionnaire administered aboard ship, (2) ascertainment of sick call visits aboard ship, and (3) structured discussions with medical department staff. The population covered includes all women serving aboard U.S. Navy ships, and an equal number of men matched on important characteristics. This project is interactive with several other Navy efforts under the DWHRP and directly interactive with two: (1) the Feasibility and Design of a Tri-Service Relational Database Architecture Allowing Service Specific and Tri-Service Reporting of Hospitalization Rates, which provides information on the population under study and builds longitudinal files, and (2) the Intervention to Reduce Adverse Gynecological Outcomes Among Women Aboard Ship Project.

Results. During year one of this study thirty-eight ships with 6,072 women assigned aboard participated in the survey portion of the study, fifty-two ships provided over 35,000 sick call visits, and thirty-seven ships provided 68 interviews of medical department personnel. Information collected as of October 30, 1995 for the first 4,337 shipboard personnel, 21,882 sick call visits, and 36 shipboard medical department personnel were analyzed and are reported in the component reports of this project. Results are reported by the major topic areas of: Population Demographics, Family Structure, and Occupational Factors; Health Conditions and Health Perceptions; Psychosocial Factors; Health Care Delivery Aboard Ship; Pregnancy and Related Issues; Heath Promotion, Wellness, and Life Style Issues; Sick Call Visits; and USS DWIGHT D. EISENHOWER (CVN-69). Brief summaries of results in each topic area appear in the results section with detailed results appearing in the appendices.

Conclusions. The first year of this study met the objectives of obtaining self-reported information from a large proportion of women and a sample of men serving aboard ship, obtaining sick call information, and conducting structured interviews with shipboard medical department staff. This success was in large measure due to the strong support of all levels of the Navy line as well as the strong support and active efforts of the Navy medical community. Women and men

took time from their busy, high-tempo lives aboard ship to fill out questionnaires for this study with a friendly, good-natured attitude.

1.0 INTRODUCTION

In 1993, Congress mandated epidemiological studies of the health status, medical care, and occupational and environmental exposures of women in the military. In response to this mandate, the Naval Health Research Center in San Diego, California, initiated a study of the health status of women aboard Navy ships. This is a report of the first results from the study, which is currently ongoing.

This project is part of the Defense Women's Health Research Program (DWHRP) which was Congressionally mandated in 1994 and 1995 (Appendix F contains the Congressional language). The project is a comprehensive epidemiologic research study of a large population of women in the military in an operationally deployed situation - assignment to ships. The Congressional Committee that established the DWHRP in 1994 commended the Department of Defense in 1995 "... for its development of a program that focuses on epidemiologic research and database development; standards and policy issues; and solutions-oriented research". Specifically, the Committee stated that the 1995 program shall include "...epidemiologic research regarding women deployed for military operations, including research on patterns of illness and injury, environmental and occupational hazards (including exposure to toxins), side-effects of pharmaceuticals used by women so deployed, psychological stress associated with military training, deployment, combat and other traumatic incidents, and other conditions of life, and human factor research regarding women so deployed". This project is designed to meet these objectives.

At the request of the U.S. Army Medical Research and Materiel Command, the Institute of Medicine (IOM) convened a Committee on Defense Women's Health Research and developed a report entitled "Recommendations for Research on the Health of Military Women", published in August of 1995. This report provides overarching recommendations which specify what the DWHRP research topic areas should be: (1) unique to military women, (2) especially prevalent among military women, and (3) related to the ability of women to perform their mission. The specific topic areas, which expand upon the Committee's recommendations for research, fall into four broad areas: (1) major factors affecting the health and work performance of military women, (2) psychological and health issues resulting from integration of women into a hierarchical male environment, or related to women and men living and working together in close quarters, (3) health promotion and disease prevention, and (4) access to and delivery of health care. The objectives of this comprehensive study touch on all of these major research areas.

This project is interactive with several other major efforts under the DWHRP and directly interactive with two: (1) the Feasibility and Design of a Tri-Service Relational Database Architecture Allowing Service Specific and Tri-Service Reporting of Hospitalization Rates, and

(2) the Intervention to Reduce Adverse Gynecologic Outcomes Among Women Aboard Ship project.

The DWHRP Tri-Service Database Project has allowed the identification of women assigned to ships through review of longitudinal computerized career history files for active-duty Navy personnel which have been developed in collaboration with this project. These files have allowed identification of individual women assigned to serve aboard particular ships through the identification of the duty station code to which the woman was assigned. Demographic information for ship personnel could then be determined, including age, race, pay grade, and occupational designation. This greatly facilitated study population identification and the matching of men serving aboard the same ship, and facilitated development of individually-specified self-administered questionnaires on many of the ships surveyed.

The Intervention to Reduce Adverse Gynecologic Outcomes Among Women Aboard Ship Project focuses on the development of educational and behavioral interventions to reduce the acquisition of sexually transmitted diseases and unplanned pregnancies among women serving aboard ship. This project utilizes state of the art non-invasive diagnostic tests for some of the most common sexually transmitted diseases — chlamydia, gonorrhea, and serologic markers for syphilis and hepatitis. Highly developed educational interventions have been developed and tested for efficacy among Marine Corps men on deployment and are now being adapted and tested on women aboard ship on deployment.

1.1 Women Aboard Ship.

Women have been assigned to noncombatant ships since 1978. Currently, approximately 8,564 women serve aboard or are scheduled to serve aboard U.S. Navy ships [1]. This includes approximately 5,965 women serving aboard Logistic/Support ships, 103 women serving with embarked staff personnel, 565 women serving with Carrier Air Wings, 328 women serving with other Shipboard Air Units, 23 women serving with Miscellaneous Shipboard Units and 1,580 women serving aboard Combatant ships. These numbers do not include women serving aboard U.S. Navy Supply Ships or Hospital Ships. The Bureau of Naval Personnel (BUPERS) PERS-00W has developed assignment plans which will result in over 13,000 women serving aboard over 130 U.S. Naval ships by 1998. Since 1978, more than 35,000 women have served aboard U.S. Navy ships [2].

According to BUPERS 409, there are currently 44 noncombatant ships with women aboard, stationed in 10 home ports [3]. There are currently 36 combatant ships, including 8 Aircraft Carriers, with women serving aboard. These counts do not include women aboard Hospital Ships or other U.S. Naval Service (USNS) Ships.

It is the goal of the Navy, as stated by ADM Boorda, Chief of Naval Operations (CNO), to have all ship types, except submarines, open to women. Women aboard ships face a wide range of occupational issues that are exaggerated because of the intense industrial environment of

a ship, the intensity of activity when deployed, long-term separation from home, and factors associated with social isolation and integration. This large number of unique occupational stressors facing young women involved in non-traditional occupations makes the study of this population imperative both to guarantee a healthful work environment and to keep readiness at a maximal level.

Data derived from shipboard outpatient records, other external sources, and survey data will provide information of immediate relevance to health care for women aboard ships. This information will assist Bureau of Medicine and Surgery (BUMED) and fleet decision-makers in several ways: (a) it will help define the personnel, resources, and training needed to meet the medical needs of women aboard Navy ships; (b) it will provide a scientific basis for making changes to the provision of medical care aboard ships to better meet the medical needs of deployed women and men, potentially improving effectiveness; (c) it will provide a basis for provisioning adequate quantities of contraceptives and medical supplies aboard ships to meet the needs of women; (d) it will provide an assessment of potential health hazards to personnel; (e) it will help assess whether more pre-deployment screening would reduce the need for medical evacuation; and (f) it will provide a scientific basis for design and implementation of interventions.

The development of a longitudinally followed cohort such as this will enhance our understanding of the primary issues facing women aboard ships, determine the magnitude of issues and their impact on readiness, and provide the information needed to take corrective action to maintain optimal well-being of military women and optimal military readiness at all times.

1.2 Issues Facing Women Aboard Ship.

Consultations with personnel at BUMED, BUPERS, CINCLANTFLT, CINCPACFLT, and others have assisted in defining the major issues facing women aboard ship. Pregnancy-related issues are of paramount importance. The following paragraphs list the major issues associated with women aboard ship that have emerged in discussions. These issues have been the basis for the approach that has been taken in this study and for defining the content of the data collection instruments that were used during this first year. These major issues have also been the basis for defining specific research topics that will be pursued against the collected data throughout the second year and subsequent years of the project. Clearly, not all issues represented are of equal magnitude in terms of effects on fleet readiness, and this listing should not be construed as representing equality of thrust.

In keeping with the major research topic guidelines recommended by the IOM: (1) unique to military women, (2) especially prevalent among military women, (3) related to the ability of military women to perform their mission responsibilities; these major topic areas have been further subdivided into the following categories for this project: (1) occupational health; (2) health care delivery aboard ship; (3) pregnancy; (4) health promotion (diet and nutrition, physical exercise, tobacco and alcohol use, and preventive services); (5) psychosocial; and (6) family

issues. A brief explanation of each of these topics and the issues involved in each is contained in the following paragraphs.

Occupational health. The shipboard environment is intensely industrial. Women assigned to ships are exposed to a wide array of physical, chemical, and other occupational hazards. Many occupations currently held by women were traditionally filled by men. Women engaged in non-traditional occupations may be exposed to occupational stressors that may affect women differentially from men [4]. For example, repetitive biomechanical stressors associated with hand-tool operation and vibration may be associated with higher rates of some illnesses in women than in men in the same occupations [5]. Environmental exposure to solvents, pesticides and other toxins may have effects on reproductive health [6]. In addition to these exposures, risks associated with exposure to ionizing radiation and the potential effects of non-ionizing radiation (microwaves, electromagnetic fields) on women's reproductive health need further scrutiny [7,8]. Possible synergistic effects of multiple exposures also need to be quantified.

Health care delivery. Planning resources to provide optimal health care for a growing proportion of women serving aboard a wider range of ships presents a challenge for Navy medicine. Health care providers themselves believe that the increased presence of women on board may necessitate upgrading a ship's medical staff (i.e., a physician's assistant, rather than an independent duty corpsman, or a medical officer rather than a physician's assistant) [9,10]. Other research indicates that women are more likely to participate in regular Pap tests and mammography screening if the health care provider is a woman [11]. Since screening rates for cervical and breast cancer are considered markers of quality health care, such factors affecting women's utilization of preventive medical services need to be considered in planning for the full integration of women into the shipboard environment. Previous analyses have been reported of the needs for obstetrical (OB) and gynecological (GYN) care aboard the submarine tenders U.S.S. Frank Cable [9] and U.S.S. Hunley [9,10]. Hughey analyzed records of 222 women crew members associated with the U.S.S. Frank Cable, and determined that the women had 2,140 medical encounters for obstetrical or gynecological care and 176 routine prenatal OB visits during 710 woman years of military service, for a rate of 3.5 OB-GYN visits per year. The most common reasons for the visits were routine gynecological examinations (30 percent), sexually transmitted diseases (14 percent), and menstrual abnormalities (13 percent) [9]. The high frequency of OB-GYN visits suggests a major unmet need on most ships at sea, where OB-GYN referral specialists generally are not available.

Pregnancy. Women aboard ship are predominately of childbearing age, and pregnancy is common. During a one-year period ending in June 1990, 98 documented pregnancies occurred among approximately 300 women crew members assigned to the U.S.S. Frank Cable [9]. These pregnancies were presumably not evident before the women came aboard, as pregnant women are not assigned aboard ships. Women more than 20 weeks pregnant are removed from ship [12]. Women removed from shipboard assignments due to pregnancy are not replaced. Pregnancy rates aboard ship have been reported to be as high as 15-20 percent [13], resulting in major impacts on fleet readiness. Rates of pregnancy, determination of planned versus unplanned pregnancies,

and underlying motivation for the timing of pregnancies are all issues needing study. The rate of ectopic pregnancy in military populations has been described as 1 per 83 live births in an active-duty and dependent military population that received its health care at the U.S. Air Force Regional Medical Center in Wiesbaden, Germany [14]. This rate is higher than the rate of 1 ectopic pregnancy per 100 live births in the general U.S. population [15]. The rates among active-duty enlisted personnel appeared to be particularly high in the Wiesbaden region, at 1 per 27 in the Army and 1 per 28 in the Air Force [14]. These data are important since ectopic pregnancies may require rapid diagnosis and prompt surgical intervention and account for 12 percent of maternal deaths [14].

Health promotion. Recognizing the role that personal health behaviors play in morbidity and mortality risks, the Navy has established a comprehensive Health Promotion Program [16] to foster the physical and emotional well-being of its personnel and to reduce the risks of adverse health outcomes. Within the broader context of health promotion, it is becoming well-documented that men and women differ in their risks for a variety of illnesses as well as in health-related behavior. These issues are particularly salient in the Navy shipboard environment, where women's expanded roles are exposing them to new physical and psychological demands and potential health hazards.

Diet and nutrition. Shipboard food must meet Navy nutritional standards, but storage and space constraints on deployed ships limit the range of menu options available. In general, it has been reported that foods eaten away from home have lower nutrient densities and higher fat content than foods prepared and eaten at home [17]. While efforts are being made to offer more fresh produce and at least one low-fat entree choice at every meal in Navy mess halls and galleys, concern for the palatability and acceptability of military food has resulted in setting Navy nutritional standards at levels that exceed the recommended daily allowance (RDA) for fat (not to exceed 35% of total calories under garrison feeding conditions), salt (2 to 4 times the RDA for sodium), and protein (about twice the recommended daily amount) [18]. Navy nutritionists also acknowledge that female personnel may require supplemental iron to meet the recommended 18 mg/day for women [18]. Because women have different nutritional needs than men, particularly in micronutrients (e.g., iron, calcium) but require fewer calories, women aboard ship may find it difficult to meet their dietary needs or choices (e.g., more fresh produce, less fat, less sodium, less red meat) [19].

Physical exercise. Regular physical activity is essential for cardiovascular health, musculoskeletal strength and flexibility, and weight control [20]. It is important, therefore, that women aboard ship be provided with adequate facilities and sufficient time to engage in both aerobic and anaerobic exercise. In addition to its cardiovascular and weight-maintenance benefits, aerobic exercise has been found to improve mood profiles and self-esteem in women [21] and may help reduce their risk of certain cancers [22]. Weight-bearing exercises, such as walking or jogging, are especially important for women to help preserve bone density and prevent osteoporosis [22]. Anaerobic weight training should be included in the exercise regimen to help build and maintain muscle strength, which is critical for safely navigating the shipboard

environment as well as performing a number of occupational specialties. It is significant in this regard that shipboard personnel have been found to have somewhat lower classification scores on the Navy's mandatory Physical Readiness Test (PRT) for sit-ups, push-ups, and overall PRT score than personnel in other communities [23].

Tobacco and alcohol use. Within the Navy community, both cigarette smoking and alcohol consumption were reported to be highest among personnel assigned to surface ships (women were not included in this study) [23]. The same study found that personnel in both surface ship and submarine communities consistently reported less positive feelings about their lives than did shore-based personnel [23]. Substance use and abuse are often associated with stress and negative moods, such as loneliness, boredom, and depression [24]. There is mounting evidence that women in stressful occupations may be at particular risk for substance use and abuse [25]. Women aboard ship may be at high risk for substance abuse, although this has not been documented. It is important to explore these relationships and their implications for preventive interventions.

Preventive services. Approximately one fourth of all visits to sick bay aboard ship are for routine health services and preventive care [26,27]. The monthly visit rate for women is higher than for men, due entirely to female-specific procedures, such as Pap tests and contraceptive prescriptions [26,1]. It has been reported that three of the major preventive health services available to women; (1) pap tests, (2) clinical breast examinations, and (3) hypertension screening - can lower morbidity and mortality rates depending on the age of the population [28,29]. Other services associated with female reproductive health, such as pregnancy tests, birth control counseling and prescriptions, and screening and education programs for STDs, are equally important to women's health. Because of the alarming increase in STD rates nationally, and because untreated chlamydia, gonorrhea, and infections from other pathogens in women can result in infertility, ectopic pregnancy, and congenital problems in offspring, reducing the risks associated with STDs has become especially critical [30,11,9].

Psychosocial. Stress from a wide range of causes is a major occupational health problem for women [31], and many gender differences in health status may be associated with responses to stress. For example, depression, obsessive-compulsive disorders, and panic disorders have been reported to be more prevalent in women, while substance abuse, antisocial personality disorders, and suicide tend to be more frequent in men [32]. The stressors typical of shipboard life, such as separation from family, crowding, noise, and work intensity, may be compounded for women by their new role on board ship. As women are brought aboard some ships for the first time, their status as a minority subgroup will be highlighted, and new job responsibilities and role expectations may test self-esteem and contribute to stress. On the other hand, job rewards, such as recognition and challenge, may mitigate the negative effects of work-related stress [33]. This study will include measures of the degree of stress experienced by women aboard ship, the coping strategies they employ, and the impact of stress on their health and quality of life. Because women generally report more reliance on social support networks than men [34,35], and because

social support is linked to health, an important area of investigation will be the availability and utilization of social support in the shipboard milieu.

Family issues. Family separation issues will not be a major focus of this study. This important subject area will be covered through interactive proposals in association with Universities. As women begin to take on a larger role in today's military, it is essential to determine what impact this has on their families. Military-induced separation has been ranked by military spouses as the most dissatisfying aspect of military life [36-38]. To date, there has been little investigation specifically into the effects of separation of women in the military from their families. However, a study examining the effects of separation among civilian mothers of infants, children, and toddlers noted agitation during the separation period and depressed behavior and activity levels following the mother's return [39]. More research is needed, since studies to date indicate there is evidence that family factors influence retention. An important finding is that high-performing and successful military personnel are more likely to plan to remain in the military if they believe that the quality of military life for their children compares favorably with that for children in civilian life [40,41].

1.3 Background and Review of Previous Studies.

Recent Congressional legislation has mandated research on women's health issues by the Department of Defense [42]. Specifically, the legislation calls for research related to women experiencing combat stress and trauma, exposure to toxins and other environmental hazards, stress in warfare situations, mental health deterioration, including post traumatic stress disorder (PTSD), and depression. Additionally, the legislation requires human factor studies related to women. The legislation mandates program planning, research infrastructure development, database development, cohort development, health surveillance, and epidemiologic studies related to women in active-duty service [42]. Definition of issues has been further detailed by a Tri-Service Defense Women's Health Research Program Working Group that has established epidemiologic studies of the health care needs of deployed women and documentation of patterns of illness and injury as top research priorities [43].

Previous studies have indicated that women have unique health problems and different health care requirements than men, both in disorders of the reproductive systems and in general [44,26]. Women also have different patterns of health care use aboard ships [26,1]. Issues such as the type of health care provided and delegation of medical tasks on Navy ships such as destroyer tenders and repair ships with women aboard have been examined [26,1,45]. Major health-related issues concerning women in the Navy and other services have been reviewed in some detail and hospitalization rates of women in the Navy have been analyzed [1]. The largest single reason for hospitalization of Navy women was pregnancy, which accounted for 22 percent of all hospitalizations during 1974-1979 [1].

In addition, previous studies have examined issues that are complementary and lay the groundwork for this study. An NHRC study by Nice and Hilton reported patterns of medical care

use aboard ships by Navy men and women during 1988-1989 [30,46]. The overall objective of this prior study was to identify health care requirements of women aboard Combat Logistics Force ships and recommend medical department adjustments to meet those requirements. The study analyzed quarterly reports provided during October 1988 through October 1989 by medical departments on 20 ships and data on individual patient encounters collected from sick-call logs of 15 ships during November 1988 and 20 ships in June 1989. The November 1988 data were collected aboard seven destroyer tenders, two repair ships, two oilers, and four salvage ships with 7,688 crew members, of whom 24 percent were women. The June 1989 data were from six destroyer tenders, one repair ship, five submarine tenders, four oilers, and four salvage ships, representing 13,592 crew members, of whom 25 percent were women. Types of data collected quarterly included number of crew members and medical department staff, total days at sea, reasons for sick-call visits, pelvic examinations, referrals off ship, medical evacuations, new pregnancies, and other information.

An NHRC study by Hoiberg examined patterns of illness in Navy women [1] and provided a context for more recent reports on illnesses and needs for medical care by Navy women during deployments. A report titled, "Obstetric and Gynecological Needs of Women Assigned to Sea Duty Aboard a Submarine Tender", examined needs for enhancements to reproductive medicine services aboard the U.S.S. Frank Cable [9]. Additional information and data on sick-call visits were reported by LCDR Martha Marean, NC, USNR, in a report of medical care for women aboard a submarine tender titled, "Medical Care for Women Crew members aboard the U.S.S. Hunley" [47]. These reports have helped to identify major issues and to define areas requiring surveillance and further study.

2.0 METHODS

This project utilizes three primary data collection methods: (1) a self-administered survey given aboard ship, (2) ascertainment of sick call visits aboard ship, and (3) a structured interview of medical department staff aboard ship. The population covered includes all women serving aboard U.S. Navy ships, and an equal number of men matched on important characteristics.

2.1 Development of List of Ships Enrolled in the Study.

The process of identifying ships to be enrolled in this study began by obtaining a list of U.S. Navy ships with women crew members assigned from Chief, Bureau of Naval Personnel, Washington, D.C. This list was coordinated and modified based on review with respective Type Commanders to confirm availability and to receive permission to conduct research aboard the targeted ships. Ships with operational commitments which precluded them from participating in the study were dropped from the list. Additionally, USNS Ships and Hospital Ships were not enrolled in this study. The final list identified 74 ships as potential candidates for enrollment in the study. The list of ships enrolled in this study is presented in Table 1.

Table 1. Eligible Ships, Ship Types, and Crew Sizes by Gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	HOME PORT	NUMBER OF PERSONNEL ASSIGNED WOMEN	MEN	TOTAL	PLAN YEAR
1	USS PLATTE (AO 186)	OILER	NORFOLK, VA	85	183	268	95
2	USS SHENANDOAH (AD 44)	DESTROYER TENDER	NORFOLK, VA	497	1,041	1,538	95
3	USS GRAPPLE (ARS 53)	SALVAGE SHIP	LITTLE CREEK, VA	36	67	103	95
4	USS SANTA BARBARA (AE 28)	AMMUNITION SHIP	CHARLESTON, SC	87	290	377	95
5	USS MOUNT BAKER (AE 34)	AMMUNITION SHIP	CHARLESTON, SC	72	292	364	95
6	USS BARRY (DDG 53)	GUIDED MISSILE DESTROYER	NORFOLK, VA	19	319	338	95
7	USS FRANK CABLE (AS 40)	SUBMARINE TENDER	CHARLESTON, SC	308	923	1,231	95
8	USS DIXON (AS 37)	SUBMARINE TENDER	SAN DIEGO, CA	397	981	1,378	95
9	USS DETROIT (AOE 4)	FAST COMBAT SUPPORT SHIP	EARLE, NJ	63	548	611	95
10	USS MERRIMACK (AO 179)	OILER	NORFOLK, VA	90	220	310	96
11	USS SHASTA (AE 33)	AMMUNITION SHIP	CONCORD, CA	72	340	412	95
12	USS MCKEE (AS 41)	SUBMARINE TENDER	SAN DIEGO, CA	438	1,128	1,566	95
13	USS CAMDEN (AOE 2)	OILER	BREMERTON, WA	69	576	645	95
14	USS L. Y. SPEAR (AS 36)	SUBMARINE TENDER	NORFOLK, VA	394	1,038	1,432	95
15	USS KISKA (AE 35)	AMMUNITION SHIP	CONCORD, CA	75	321	396	95

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	HOME PORT	NUMBER OF PERSONNEL ASSIGNED WOMEN	MEN	TOTAL	PLAN YEAR
16	USS LASALLE (AGF 3)	MISC COMMAND SHIP	GAETA, IT	56	403	459	95
17	USS SIMON LAKE (AS 33)	SUBMARINE TENDER	SARDINIA, IT	338	793	1,131	95
18	USS MONONGAHELA (AO 178)	OILER	NORFOLK, VA	97	195	292	95
19	USS GRASP (ARS 51)	SALVAGE SHIP	LITTLE CREEK, VA	27	87	114	95
20	USS EISENHOWER (CVN 69)	AIRCRAFT CARRIER (NP)	NORFOLK, VA	524	4,476	5,000	95
21	USS SUPPLY (AOE 6)	FAST COMBAT SUPPORT SHIP	NORFOLK, VA	7	594	601	95
22	USS JOHN YOUNG (DD 973)	DESTROYER	SAN DIEGO, CA	24	306	330	95
23	USS CURTIS WILBUR (DDG 654)	GUIDED MISSILE DESTROYER	SAN DIEGO, CA	23	328	351	95
24	USS CORONADO (AGF 11)	MISC COMMAND SHIP	SAN DIEGO, CA	55	549	604	95
25	USS CAPE COD (AD 43)	DESTROYER TENDER	SAN DIEGO, CA	424	1,145	1,569	95
26	USS MOUNT HOOD (AE 29)	AMMUNITION SHIP	CONCORD, CA	96	329	425	95
27	USS COMSTOCK (LSD 45)	DOCK LANDING SHIP	SAN DIEGO, CA	37	298	335	95
28	USS RAINIER (AOE 7)	FAST COMBAT SUPPORT SHIP	BREMERTON, WA	74	507	581	95
29	USS FLINT (AE 32)	AMMUNITION SHIP	CONCORD, CA	90	309	399	95
30	USS MAUNA KEA (AE 22)	AMMUNITION SHIP	CONCORD, CA	27	287	314	95
31	USS CIMARRON (AO 177)	OILER	PEARL HARBOR, HI	53	149	202	95

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	HOME PORT	NUMBER OF PERSONNEL ASSIGNED WOMEN	MEN	TOTAL	PLAN YEAR
32	USS WILLAMETTE (AO 180)	OILER	PEARL HARBOR, HI	71	167	238	95
33	USS SAFEGUARD (ARS 50)	SALVAGE SHIP	PEARL HARBOR, HI	25	78	103	95
34	USS SALVOR (ARS 62)	SALVAGE SHIP	PEARL HARBOR, HI	23	81	104	95
35	USS YELLOWSTONE (AD 41)	DESTROYER TENDER	NORFOLK, VA	425	946	1,371	95
36	USS WASP (LHD 1)	AMPHIBIOUS ASSAULT (MP)	NORFOLK, VA	7	1,197	1,204	96
37	USS KEARSARGE (LHD 3)	AMPHIBIOUS ASSAULT (MP)	NORFOLK, VA	7	1,196	1,203	96
38	USS SAIPAN (LHA 2)	AMPHIBIOUS ASSAULT (MP)	NORFOLK, VA	6	1,194	1,200	96
39	USS NASSAU (LHA 4)	AMPHIBIOUS ASSAULT (MP)	NORFOLK, VA	4	1,197	1,201	96
40	USS MOUNT WHITNEY (LCC 20)	MISC COMMAND SHIP	NORFOLK, VA	79	616	695	95
41	USS BRISCOE (DD 977)	DESTROYER	NORFOLK, VA	5	329	334	96
42	USS HAYLER (DD 997)	DESTROYER	NORFOLK, VA	31	307	338	96
43	USS LABOON (DDG 58)	GUIDED MISSILE DESTROYER	NORFOLK, VA	12	316	328	96
44	USS EMORY S. LAND (AS 39)	SUBMARINE TENDER	NORFOLK, VA	457	1,069	1,526	95
45	USS HOLLAND (AS 32)	SUBMARINE TENDER	GUAM	360	1,021	1,381	95
46	USS ABRAHAM LINCOLN (CVN 72)	AIRCRAFT CARRIER (NP)	BREMERTON, WA	273	4,600	4,873	96
47	USS BUTTE (AE 27)	AMMUNITION SHIP	EARLE, NJ	43	373	416	96

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	HOME PORT	NUMBER OF PERSONNEL ASSIGNED WOMEN	MEN	TOTAL	PLAN YEAR
48	USS SACRAMENTO (AOE 1)	FAST COMBAT SUPPORT SHIP	BREMERTON, WA	68	546	614	95
49	USS PUGET SOUND (AS 37)	DESTROYER TENDER	NORFOLK, VA	419	1,055	1,474	96
50	USS SEATTLE (AOE 3)	FAST COMBAT SUPPORT SHIP	EARLE, NJ	79	461	540	96
51	USS ARCTIC (AOE 8)	FAST COMBAT SUPPORT SHIP	NORFOLK, VA	99	429	528	96
52	USS MOOSBRUGGER (DD 980)	DESTROYER	MAYPORT, FL	24	365	389	96
53	USS ASHLAND (LSD 48)	AMPHIBIOUS DOCK LANDING SHIP	LITTLE CREEK, VA	32	362	394	96
54	USS TORTUGA (LSD 46)	AMPHIBIOUS DOCK LANDING SHIP	LITTLE CREEK,VA	26	396	422	96
55	USS GUNSTON HALL (LSD 44)	AMPHIBIOUS DOCK LANDING SHIP	LITTLE CREEK, VA	7	395	402	96
56	USS GEORGE WASHINGTON (CVN 73)	AIRCRAFT CARRIER (NP)	NORFOLK, VA	2	4,998	5,000	96
57	USS STENNIS (CVN 74)	AIRCRAFT CARRIER (NP)	NORFOLK, VA	243	4,513	4,756	96
58	USS JOHN F. KENNEDY (CV 67)	AIRCRAFT CARRIER	MAYPORT, FL	97	4,476	4,573	96
59	USS BELLEAU WOODS (LHA 3)	AMPHIBIOUS ASSAULT (MP)	SASEBO, JAPAN	4	982	986	96
60	USS BENFOLD (DDG 83)	DESTROYER	SAN DIEGO, CA	18	308	326	96
61	USS CONSTELLATION (CV 64)	AIRCRAFT CARRIER	SAN DIEGO, CA	2	3,083	3,085	96

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	HOME PORT	NUMBER OF PERSONNEL ASSIGNED WOMEN	MEN	TOTAL	PLAN YEAR
62	USS DAVID R. RAY (DD 971)	DESTROYER	EVERETT, WA	2	357	359	96
63	USS ESSEX (LHD 2)	AMPHIBIOUS ASSAULT (MP)	SAN DIEGO, CA	5	1,170	1,175	96
64	USS FLETCHER (DD 992)	DESTROYER	PEARL HARBOR, HI	20	339	359	96
65	USS FORT MCHENRY (LSD 43)	AMPHIBIOUS DOCK LANDING SHIP	SASEBO, JAPAN	27	334	361	96
66	USS KINKAID (DD 965)	DESTROYER	SAN DIEGO, CA	22	337	359	96
67	USS NIMITZ (CVN 68)	AIRCRAFT CARRIER (NP)	BREMERTON, WA	210	3,177	3,387	96
68	USS OLENDORF (DD 972)	DESTROYER	SAN DIEGO, CA	1	358	359	96
69	USS PAUL F. FOSTER (DD 964)	DESTROYER	EVERETT, WA	22	337	359	96
70	USS PELELIU (LHA 5)	AMPHIBIOUS ASSAULT (MP)	SAN DIEGO, CA	6	980	986	96
71	USS RUSHMORE (LSD 47)	AMPHIBIOUS DOCK LANDING SHIP	SAN DIEGO, CA	1	1,174	1,175	96
72	USS TARAWA (LHA 1)	AMPHIBIOUS ASSAULT (MP)	SAN DIEGO, CA	5	981	986	96
73	USS KITTY HAWK (CV 63)	AIRCRAFT CARRIER	SAN DIEGO, CA	20	3,065	3,085	96
74	USS MILIUS (DDG 69)	GUIDED MISSILE DESTROYER	NORFOLK, VA	1	325	326	96
	TOTALS			**7,944**	**69,012**	**76,956**	

2.2 U.S. Navy Shipboard Health Survey Development.

Several methods were used for the development of the U.S. Navy Shipboard Health Survey; these included: (1) review of extant questionnaires, literature, and standard scales, (2)

bringing together of subject matter experts in workshops, (3) elucidation of major issues from knowledgeable sources, and (4) review of Navy requirements concerning the level of women's health and access to health care.

Review of extant questionnaires, literature, and standard scales. The following questionnaires were obtained and reviewed. Items were adopted from them for use in the questionnaires developed for this project whenever practical.

(1) Centers for Disease Control and Prevention/National Center for Health Statistics
- National Health Interview Survey Questionnaires
- Health Interview Survey Form HIS-1 (1992)
- Health Interview Survey Form HIS-2A (1992)
- National Ambulatory Health Care Survey: 1994, 1995, and proposed 1996 patient record data-collection forms
- Youth Behavior Survey

(2) Department of Defense
- Office of Assistant Secretary of Defense (Health Affairs) 1995 Survey of Health Related Behaviors Among Military Personnel (Draft)

(3) U.S. Navy
- Naval Health Research Center Health and Nutrition Survey
- Naval Health Research Center Health and Physical Readiness Program Evaluation Questionnaire
- Post-deployment Female Questionnaire (Portsmouth Naval Hospital)
- Post-deployment Male Questionnaire (Portsmouth Naval Hospital)
- Health Care Provider Questionnaire (Portsmouth Naval Hospital)
- Naval Health Research Center Reproductive Health Survey
- Naval Health Research Center Family Impact Questionnaire
- Naval Health Research Center Quality of Life Enjoyment and Satisfaction Questionnaire
- Naval Health Research Center STD/HIV Risk Survey
- Naval Health Research Center U.S.S. Theodore Roosevelt No-Smoking Policy Survey
- Naval Health Research Center/AIRLANT Tobacco Use Policy Opinion Survey
- Naval Health Research Center, Navy Seabee Health Questionnaire
- Naval Health Research Center, Navy Follow-Up for Fitness Questionnaire
- Navy Quality of Life Questionnaire (1993 Craiger JS, et al.)
- Marine Corps Quality of Life questionnaire (Kerce, et al. 1993)
- Naval Health Research Center, Health Care Professional Survey—Attitudes and Practices Concerning Tobacco Use
- Naval Health Research Center, Patient Care Survey
- Naval Health Research Center, Health Care Survey for Health Care Providers
- Naval Health Research Center, Health Care Survey for Women
- Naval Health Research Center, Female Sexual Abuse Survey

(4) U.S. Army
Walter Reed Army Institute of Research, Impact of Operation Desert Storm on Military Service Personnel
Army Health Promotion Program Fit-to-Win Health Risk Appraisal Questionnaire

(5) Harvard University
Diet Assessment

(6) Georgia State University
Norris Traumatic Stress Schedule [45]

(7) Beloit College
Dissociative Experiences Scale [48]

(8) Emory University
Healthier People Questionnaire

(9) Special Contributions
Dr. Leon R. Derogatis, SCL-90-R® Symptom Checklist
J.L. Horn, K.W. Wanberg, and F.M. Foster, Alcohol Use Inventory
CDR Michael J. Hughey, MC, USNR, Winnetka, Illinois, Suggested Questions for Navy Shipboard Health Survey
LCDR Jacqueline Brooks, NC, USN, Suggested Questions for Navy Shipboard Health Survey
COL James A. Martin, USA, Ret. (HQ, USAMRMC, Fort Detrick MD), Revised Stress and Family-related Questions for Navy Shipboard Health Survey

Standard Scales. An extensive literature review was conducted as well as a review of the above questionnaires for the development of the U.S. Navy Shipboard Health Survey and the following standard scales and inventories were deemed appropriate and were selected for inclusion in the survey:

(1) Brief Symptom Inventory-63 (BSI-63) [49]. This is a 63-item subset of the Derogatis SCL-90—R, that assesses psychopathology and psychological distress along multiple dimensions [49]. Its reliability and validity have been previously measured, and alpha coefficients for the 9 primary symptom dimensions indicate a high degree of consistency among the items that compose each subscale [50]. The scale measures psychological distress in general, according to previous studies that have assessed its dimensionality in adults and younger subjects (11). Norms are available for several populations [51]. (Form 78, Q53)

(2) Center for Epidemiological Studies Depression Scale (CES-D) [52]. The CES-D scale measures current frequency of depressive symptoms, with emphasis on depressed affect, and was designed for survey research use [52]. The full scale includes items that reflect depressed affect;

feelings of guilt, worthlessness, helplessness, hopelessness; sleep disturbance; loss of appetite; and psychomotor deficits. Subjects are asked to indicate the number of days during the past 7 days that they experienced each symptom. The CES-D has been validated in household surveys on probability sample and in clinical validation studies. Alpha coefficients were 0.90 or above for normal subjects and depressed patients. The scale is oriented toward measurement of depressed mood rather than toward identification of severe depression. It has been tested for reliability and validity in numerous previous studies [52-54]. A seven-item version of the CES-D was developed and validated previously against the full CES-D [55,56]. The validated shortened version was used to minimize questionnaire length. This version provides two subscales, a 3-item depressed mood scale and a 4-item malaise scale, intended to allow assessment of physiogenic bias [55]. (Forms 456 and 78, Q41)

(3) Client Satisfaction Questionnaire (CSQ) [57]. This is an 18-item scale that measures general satisfaction with medical care services. (Form 90, Q69-77)

(4) Health Belief Model Questionnaire [58]. This standard instrument assesses multiple dimensions of the Health Belief Model [59] using 4-point Likert-type items. The instrument has been used in previous studies [58,60]. (Form 123, Q51; Form 456, Q53)

(5) Health Perceptions Questionnaire (HPQ) [61]. This instrument is a 29-item scale that investigates subjective self-reports of physical health. It was developed for evaluation of medical care and population assessments of perceived health status. It requires about 10 minutes to complete. This questionnaire has been tested in a variety of settings [62]. (Form 90, Q66-67)

(6) Mental Health Inventory (MHI) [63]. This instrument is a 38-item general measure of mental health and psychological functioning. It is used to assess the psychological health of populations, identify unmet needs for care, and predict the use of mental health and general health services. A 6-item scale that assesses reliability is incorporated into the instrument. The total of 44 items takes about 10 minutes to complete. (Form 90, Q49-65)

(7) Social Support Inventory [34,35]. A number of epidemiological studies have been performed linking social support to physical and mental health [35,64], although previous research suggests that the relationship may be stronger in men than women when other major risk factors have been taken into account [65]. A standard index of social support is used to assess the extent of the respondent's network of relatives and friends, and frequency of contact with these individuals. The index was developed for use on a probability sample of 6,928 adults in Alameda County, California, and has been tested and validated in numerous previous studies [34,66,67]. Although it used a different and considerably longer instrument to assess social support, a study of military recruits in training indicated that individuals who had many negative life events and less social support had a higher frequency of repeated illnesses than those with fewer negative life events and more social support [68]. (Forms 456 and 78, Q47-51)

(8) Medical Interview Satisfaction Scale (MISS) [69]. This 29-item scale was developed to measure the degree of satisfaction with a particular consultation or provider. It takes less than 10 minutes to complete. (Form 90, Q68)

(9) Military Stress Inventory (WRAIR). This is an inventory designed for military populations consisting of questions regarding stress experienced during the past two weeks as a result of a wide range of concerns ranging from deployment to personal and family health and financial issues. It was used in the Walter Reed Army Institute of Research (WRAIR) Post-Desert Storm studies of Persian Gulf War Veterans. (Forms 456 and 78, Q42-Q45)

(10) Quality of Life Scale (Andrews-Withey QOL) [28]. The questionnaire included a four-item Quality of Life scale previously used in research on Navy populations.

Bringing together of subject matter experts in workshops. Two workshops focusing on the U.S. Navy Shipboard Health Survey development were held in San Diego, California, the first on March 1-2, 1995, and the second on May 8-9, 1995. Drafts of the survey were circulated to participants between workshops. There were 17 participants in the first workshop and 22 in the second workshop. (Appendix A contains a complete list of participants for each workshop.) Participants included epidemiologists, psychologists, family and social science experts, and other subject matter experts from the Department of Defense and Universities. This panel of experts reviewed the survey relevance, scientific merit, comparability with previous studies, and other important characteristics.

Elucidation of major issues from knowledgeable sources. A series of briefings were conducted to inform key players of the intent and scope of the U.S. Navy Shipboard Health Survey, its role in this study, and to elucidate from them the major issues and areas of research requiring special emphasis. These briefings included: RADM J.H. Black, Fleet Surgeon, Atlantic Fleet; RADM D. Frost, Fleet Surgeon, Pacific Fleet; CAPT T.G. Patel, Director, Surface Medicine, Navy Bureau of Medicine and Surgery; the COMNAVAIRLANT Force Medical Officer; the COMNAVSUBLANT Force Medical Officer; the COMNAVSURFLANT Force Medical Officer; the COMNAVAIRPAC Force Medical Officer; the COMNAVSUBPAC Force Medical Officer; the COMNAVSURFPAC Force Medical Officer; the Special Assistant for Women's Policy, Bureau of Naval Personnel; the Process Action Team on Women's Issues of the Navy Bureau of Medicine and Surgery; a Naval Aerospace and Operational Medicine Institute symposium, and a conference at NATO Headquarters on Women in NATO. (Appendix A contains a complete listing of briefings.)

Review of Navy requirements. SECNAV INSTRUCTION 1000.10, Department of the Navy (DoN) Policy on Pregnancy of 06 February 1995 specifies a bi-annual report from BUPERS to the Assistant Secretary of the Navy concerning knowledge level of women regarding health and access to health care by women. Items were included in the survey to provide information to BUPERS on the medically-related aspects of these issues. Specifically, these questions were designed to assess the knowledge level of women concerning the availability of medical and other

services available for family planning and other medical concerns; and to examine issues of priority for obstetric and gynecological services for women preparing for deployment. (Appendix E contains the complete text of this DoN policy.)

2.3 U.S. Navy Shipboard Health Survey Sampling and Administration Design.

Sampling Design. Because a wide range of data elements are involved in the U.S. Navy Shipboard Health Survey, a single survey instrument encompassing all elements would be too long for completion within a reasonable period of time. Therefore, a set of essential core items was identified for completion by all subjects, and the remainder of the data elements were divided among four versions plus an anonymous supplemental survey. The U.S. Navy Shipboard Health Survey has four alternate forms, Forms 123, 456, 78, and 90. (Appendix C contains a complete set of these forms.) All forms for the U.S. Navy Shipboard Health Survey consist of 63 identical core items, 18 identical core items in a women's section, and a variable number of items that differ by form. Forms 123 and 456 focus on health status issues while Forms 78 and 90 focus on psychological status. (Appendix C contains a detailed listing of the topic areas covered by each form.) Table 2 summarizes the focus of each survey type.

Table 2. Survey Topic Focus by Form Type, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

FORM	TERMINAL DIGIT OF RESPONDENT'S SOCIAL SECURITY NUMBER	APPROXIMATE PERCENT OF SUBJECTS RECEIVING THIS FORM	MAIN FOCUS
123	1, 2, or 3	30%	Health status
456	4, 5, or 6	30%	Health status
78	7 or 8	20%	Psychological status
90	9 or 0	20%	Psychological status

Length Considerations. The logistics of administering a survey aboard ship required that a simple procedure be developed for allocating forms of the survey to subjects that could be reliably performed under the difficult and demanding conditions encountered aboard ships. The research department of the Social Security Administration (SSA) verified that the terminal digit of the Social Security Number (SSN) is assigned in a serial sequence and may be treated as a random number for all practical uses. The SSN is readily available for all personnel and served as the basis for deciding which form of the survey each SSN can be validated as needed using the CHAMPION Research Database maintained at the Naval Health Research Center, San Diego. It was determined from the SSA that 10 percent of the population has each terminal digit 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 of the SSN. In order to select a 30 percent sample, it is possible to provide a form to individuals with any 3 terminal digits of the SSN, for example, those whose SSNs end in 1, 2, or 3. Another 30 percent sample could be selected for another form, consisting of those

whose SSNs end in 4, 5, or 6. Similarly, a 20 percent sample could consist of those whose SSNs end in 7 or 8, and another 20 percent sample of those whose SSNs end in 9 or 0.

Table 3. Form Distribution by Terminal Digit of Social Security Number, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

SSN TERMINAL DIGIT	FORM NUMBER	SAMPLE
1, 2, or 3	Form 123	30%
4, 5, or 6	Form 456	30%
7 or 8	Form 78	20%
9 or 0	Form 90	20%

As depicted in Table 3 above, each form of the survey was identified with a two or three digit code that served to remind study personnel of the SSNs of the individuals who were asked to complete each form. Each form was also clearly marked with the range of SSNs of the individuals who were asked to complete the form, and the SSN of each respondent was obtained in writing to assure that the form given to the individual corresponded to the terminal digit of that individual's SSN.

When a sample of greater than 30 percent of the population was required for a particular scale, the scale was printed on two forms. For example, a 50 percent sample could be obtained by including the scale of a form given to 30 percent and on another form given to 20 percent of the population.

Variables were carefully chosen so that the key variables were a set of core items that were completed by all respondents. This assured the ability to make direct comparisons among all respondents. When non-core elements were assigned to the different forms, as needed to reduce the length of the survey, every effort was made to assure that items and scale that were most likely to be compared were included on the same forms. In the case of the anonymous survey only a single form was used.

Anonymous Supplemental Health and Behavioral Survey. An anonymous survey dealing with sensitive topic areas of sexually transmitted disease prevention and contraception was also developed. (This survey is contained in Appendix C.) The Anonymous Supplemental Health and Behavior Survey includes items on sexual behavior, unintended pregnancy, and other topics for which a respondent-identified survey was not deemed appropriate.

Survey matching design. The study is designed ultimately to include all women aboard Navy ships. To provide a comparison group of male personnel, a male subject was matched to each woman based on the following criteria:

- Work division (exact match)

- Department (exact match)
- Race (white, black, Hispanic, other) (exact match)
- Pay grade (matched by groups: E1-E3, E4-E6, E7-E9, O1-O3, O4-O6)
- Rating (exact match unless no matching individual is available in the rating. In that case, an individual with a closely related rating will be invited to participate, as described below)
- Date of birth (nearest date of birth, not to exceed plus or minus two years on most ships, as described below)

If an exact match on rating is impossible due to the limited number of individuals with that rating aboard a particular ship, then the subject must match on Navy Careers Rating Group, as specified in official Navy Careers publications. For example, data processing technicians may be matched, if necessary, with individuals in other clerical and administrative occupations when an exact match on rating is impossible.

After all other matching criteria have been met, the male will be selected who has the fewest number of days between his date of birth and the date of birth of the matching female subject. The difference will almost always be less that two years. In no case will it exceed three years (1,095 days). This is an issue primarily on ships with small complements. If the male who is selected using this procedure is unwilling to participate in the study, the next male most closely matched on date of birth who meets all other matching criteria will be matched to the female subject.

Survey Administration. Prior to conducting the survey administration aboard a U.S. Navy ship, the Commanding Officer of the ship is notified of our purpose and permission to conduct our research is requested. Notification is accomplished by Naval message, personal contact by a coordinator, or Naval letter, as appropriate. If the Commanding Officer desires, a personal brief can be provided by a coordinator.

Once permission to conduct our research is granted, liaison with the Medical Department, Administration Department, and the Women-at-Sea Coordinator begins. Through this liaison, all logistics issues are resolved, and survey administration dates are set.

Following briefing of appropriate chain-of-command and appropriate message traffic, Medical Departments aboard ship are contacted as initial shipboard liaisons. Medical Department staff assist with additional contacts as necessary aboard ship including Women-at-Sea Coordinators, the shipboard personnel department, and assist with briefings of the Executive Officers and Commanding Officers of ships included in the study.

Identification of study subjects. The procedure for identification of study subjects and the selection of the matched males in the study was accomplished as follows: (1) the shipboard population was identified using the NHRC files in the CHAMPION Research Database. An initial roster of all eligible participants was electronically developed which included all data elements

needed for matching, (2) the shipboard personnel department provided a personnel roster which was compared to the NHRC roster, and the NHRC roster was updated as needed, (3) a matching program was run to select the males to be included in the survey, (4) individual identification labels were created for each participant to be included and the label was affixed to the survey package, (5) packages were sorted by division to aid in the distribution process.

Shipboard survey packaging design. The overall administration plan included distribution of individually identified packets with all the necessary materials to each study subject. (This was not possible for the earliest ships surveyed.) Whenever possible, study subjects would be brought together in a common location, briefed on the study, and the surveys would be proctored. When, due to shipboard activity pace, it was not practical for all shipboard personnel to remain in one area, the questionnaires were distributed, the participants were allowed to fill them out in their own work spaces, and then the completed surveys were collected.

Each package contains a U.S. Navy Shipboard Health Survey, an Anonymous Supplemental Health and Behavioral Survey, a brochure which explains the purpose of the survey and provides directions for the participant, separate envelopes for returning the surveys, anonymous surveys, and consent forms, as well as a pencil to use when completing the surveys. All of the materials contained in the packages are color coded to assist the participant. The envelopes provided help to ensure that the participants' confidentiality and anonymity is protected throughout all stages of the survey process.

2.4 Sick Call Visit Ascertainment.

Two methods of ascertainment of sick call visits aboard ships are being used in conjunction with each other in this study. Initially, upon enrollment in this study, a ship is provided with a NHRC Sick Call Log. The ship implements the use of the log immediately upon receipt and maintains the log until a site visit is accomplished. During the site visit, the second method of ascertaining sick call visits aboard ship is accomplished by downloading medical encounter data files which have been entered into the Shipboard Automated Medical System (SAMS). If these files contain the data requested on the Sick Call Logs, the use of the Sick Call Logs is discontinued and SAMS is used as the primary source of data collection. If it is determined that the data files on SAMS are inadequate or incomplete, both methods of data collection are employed.

Table 4. Ships Providing Medical Encounter Data by SAMS and by NHRC Source of Medical Encounter Data, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	NAME OF SHIP	SOURCE OF ENCOUNTER DATA	
		SAMS	SICK CALL LOG
1	USS PLATTE	X	
2	USS SHENANDOAH	X	

	NAME OF SHIP	SOURCE OF ENCOUNTER DATA	
		SAMS	SICK CALL LOG
3	USS GRAPPLE	X	
4	USS SANTA BARBARA	X	
5	USS MOUNT BAKER		X
6	USS BARRY	X	
7	USS FRANK CABLE		X
8	USS DIXON	X	
9	USS DETROIT		X
10	USS MERRIMACK		X
11	USS SHASTA	X	
12	USS MCKEE		X
13	USS CAMDEN	X	
14	USS L. Y. SPEAR		X
15	USS KISKA		X
16	USS LASALLE		X
17	USS SIMON LAKE	X	X
18	USS MONONGAHELA	X	
19	USS GRASP		X
20	USS EISENHOWER		X
21	USS SUPPLY		X
22	USS JOHN YOUNG	X	
23	USS CURTIS WILBUR		X
24	USS CORONADO		X
25	USS CAPE COD	X	X
26	USS MOUNT HOOD	X	
27	USS COMSTOCK	X	
28	USS RAINIER		X
29	USS FLINT		X
30	USS MAUNA KEA		X
31	USS CIMARRON	X	

	NAME OF SHIP	SOURCE OF ENCOUNTER DATA	
		SAMS	SICK CALL LOG
32	USS WILLAMETTE		X
33	USS SAFEGUARD	X	
34	USS SALVOR	X	
35	USS YELLOWSTONE		X
36	USS WASP		X
37	USS KEARSARGE		X
38	USS SAIPAN		X
39	USS NASSAU		X
40	USS MOUNT WHITNEY		X
41	USS BRISCOE		X
42	USS HAYLER	X	
43	USS LABOON		X
44	USS EMORY S. LAND	X	X
45	USS HOLLAND		X
46	USS ABRAHAM LINCOLN		X
47	USS BUTTE		X
48	USS SACRAMENTO	X	
49	USS PUGET SOUND	X	
50	USS SEATTLE		X
51	USS ARCTIC		X
52	USS MOOSBRUGGER		X
53	USS ASHLAND		X
54	USS TORTUGA	X	X
55	USS GUNSTON HALL		X
56	USS GEORGE WASHINGTON		X
57	USS STENNIS		X
58	USS JOHN F. KENNEDY		X
59	USS BELLEAU WOODS		X
60	USS BENFOLD		X

	NAME OF SHIP	SOURCE OF ENCOUNTER DATA	
		SAMS	SICK CALL LOG
61	USS CONSTELLATION		X
62	USS DAVID R. RAY		X
63	USS ESSEX		X
64	USS FLETCHER		X
65	USS FORT MCHENRY		X
66	USS KINKAID		X
67	USS NIMITZ		X
68	USS OLENDORF		X
69	USS PAUL F. FOSTER		X
70	USS PELELIU		X
71	USS RUSHMORE	X	X
72	USS TARAWA		X
73	USS KITTY HAWK		X
74	USS MILIUS		X

Use of the Shipboard Automated Medical System (SAMS). A survey was conducted of the ships involved in this study to determine their use of SAMS for recording of medical encounters. It was found that approximately 50 percent of the ships involved in this study were using SAMS for recording of medical encounters. It was also determined that, to be useful for this study, SAMS would need to be enhanced and would need to have the system menus expanded to include medical conditions affecting women. SAMS version 7.02, due to be released in August 1995, includes the identified enhancements as well as a standard report to NHRC from SAMS. These enhancements are described in detail in the following paragraph. For the current study, ships using SAMS perform a monthly download to a floppy disk provided by NHRC and mail that disk to NHRC.

Enhancements to SAMS. A close liaison was established with the SAMS office at Navy Management Systems Support Office (NAVMASSO). An assessment of the current capabilities of SAMS was made, and several meetings were held to define necessary enhancements to SAMS to improve its utility for capturing and supplying data for shipboard research on women's health issues.

The current diagnoses selection lists for SAMS were reviewed and substantially expanded. The SAMS diagnosis menus were greatly expanded to include diagnoses specific to women and

diseases more common in women. These diagnoses were specified in terms of standard ICD-9 terminology codes to be added to SAMS version 7.02 menus.

As a first step in this procedure, conditions with relative risks of four or higher for women were identified using a table of sick call visit rates from a previous study by Nice and Hilton [70]. Examples of diagnoses added using this source were acute reactions to stress and migraine headaches, which were eight times more commonly reported as a sick call diagnosis in women; phlebitis or thrombophlebitis, which were 21 times as common in women; and kidney infection, which was 12 times more common as a sick call diagnosis in women.

Procedures were implemented to fully convert SAMS data to the ICD-9 standard definition codes. The use of standard ICD-9 definitions will enhance reporting of results in NHRC reports and journal publications. It will also provide a better basis for comparisons with acute care provided in the other services and in civilian medicine. When an ICD-9 code cannot be determined, SAMS will now prompt the provider for a clear description of the illness or symptoms that is sufficiently explicit to allow an ICD-9 coder to assign an appropriate ICD-9 code.

A general principle now incorporated in SAMS is the concept that the person reporting the diagnosis should use the most specific diagnosis possible given the evidence available. For example, directions have been given that a term such as "dermatitis" will not be used alone if the diagnosis is "contact dermatitis after using paint solvent". Explicit and complete diagnoses will improve the accuracy of coding and assist in identifying areas where further epidemiological or industrial hygiene studies may be needed.

In addition to routine recording of the shipboard diagnosis, SAMS has been expanded to obtain a particularly detailed diagnosis for every medical evacuation. This will be followed by a check of the associated hospitalizations to verify the diagnosis. These are major events and it is important to determine the provisional and discharge (final) diagnoses that resulted in the evacuation event.

2.5 Medical Department Structured Discussions.

Based on discussions with medical department personnel, and a pilot survey of open-ended questions given aboard the U.S.S. Eisenhower, a standard Medical Department Discussion Guideline Form was developed. A schedule for administering this interview was also developed. (Appendix D contains the Medical Department Discussion Guideline Form.)

Subjects. Eligible participants in this part of the study were U.S. Navy medical personnel serving aboard ship. Eligible participants include all the ship's medical department senior personnel. The titles of the eligible participants included: Senior Medical Officer (SMO), Medical Officer (MO), and Independent Duty Corpsman (IDC).

Shipboard health care discussion guidelines. Discussion guidelines were used to elicit responses from participants. The interview was divided into seven sections: Human Resources, Fiscal and Equipment Resources, Automated Data Processing (ADP) Resources, Logs and Records, Morbidity and Incidence Data, Health Care Provider Issues, and Training and Education/Health Awareness. The Human Resources section asked the health care provider about manpower resources allocated to the medical department. The Fiscal and Equipment Resources section asked about the adequacy of the medical department's budget, Authorized Medical Allowance List (AMAL), pregnancy testing, and solicited recommendations for AMAL changes to enhance the health care provided for women at sea. The ADP Resources section was designed to determine the level of utilization of the Shipboard Automated Medical Systems (SAMS) in medical department. The Logs and Records section identified the nature of record keeping in medical departments. The Morbidity and Incidence Data section attempted to determine the total medical department daily caseload, female medical daily caseload, pregnancy testing and occurrence, sexually transmitted disease (STD) incidence, and medical evacuation (MEDEVAC) frequency. The Health Care Provider Issues section was designed to evaluate the medical department personnel's feelings on their ability to provide adequate health care for a ship's female patient population. This included the physical environment of the medical department, obstetrical and gynecological (OB/GYN) services, pregnancy testing, and contraceptive availability. The Training and Education/Health Awareness section was designed to provide information about the health training and education available aboard ship. Finally, health care providers were asked for their "comments, concerns, and/or recommendations" and their opinion of the "major issues facing women aboard ship." The question asking for "comments, concerns, and/or recommendations" was asked once after the first half of the interview and again at the end of the interview.

Procedure. Interviewees were selected for participation based on their role as a health care provider for male and female U.S. Navy personnel between the time period of May 1, 1995 through July 31, 1995. Interviews were conducted by four research associates. Each of the interviewers have extensive knowledge of shipboard medical issues, and an average of 18 years of U.S. Navy experience. Half of the interviews were conducted by male interviewers and the remaining interviews were conducted by the female interviewers. The research associates conducted the interview during a time convenient for the senior medical department representative. Interviews occurred in the medical departments aboard ship. The average interview time was approximately 57 minutes.

2.6 Development of Reports.

During the workshop on 8-9 MAY 1995, collaborators met to define research domains and within the domains, to define specific hypotheses, analysis plans, and to assign particular domains to investigators with acknowledged expertise in the domain, and to develop report formats. Specific topics spanned a wide range of research domains throughout the social and medical sciences. Eleven domain areas were defined and proposed lead authors were identified. Since the time of that meeting, the participants have provided a review of the relevant literature in their

proposed topic areas, as well as an abstract, hypotheses, detailed analysis plans including sample size calculations, and proposed statistical procedures for conducting their research. (Appendix B contains the proposed research topic domains from each lead author for the eleven research topics.)

3.0 RESULTS

The results of the first year of the study indicate success in meeting the objectives and milestones set forth in the year one project plan. This section is divided into two major subsections: (1) Results I: Accomplishments which details information regarding ships surveyed, sick call data obtained and a description of the medical department personnel interviews and (2) Results II: Preliminary Findings provides brief summaries of the initial results of the major study topic areas that were defined in Section 2.

3.1 Results I: Accomplishments

3.1.1 U.S. Navy Shipboard Health Survey and Anonymous Health and Behavior Supplemental.

Status of ship surveys. Table 5 lists ships surveyed by 31 January 1996.

Table 5. Ships Surveyed by Ship Type and Crew Sizes by Gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	NAME OF SHIP	SHIP TYPE	FEMALE CREW	MALE CREW	TOTAL CREW
1	USS PLATTE	OILER	85	183	268
2	SS SHENANDOAH	DESTROYER TENDER	497	1,041	1,538
3	USS GRAPPLE	SALVAGE SHIP	36	67	103
4	USS SANTA BARBARA	AMMUNITION SHIP	87	290	377
5	USS MOUNT BAKER	AMMUNITION SHIP	72	292	364
6	USS BARRY	GUIDED MISSILE DESTROYER	19	319	338
7	USS FRANK CABLE	SUBMARINE TENDER	308	923	1,231
8	USS DIXON	SUBMARINE TENDER	397	981	1,378
9	USS DETROIT	FAST COMBAT SUPPORT SHIP	63	548	611
10	USS SHASTA	AMMUNITION SHIP	72	340	412
11	USS McKEE	SUBMARINE TENDER	438	1,128	1,566

	NAME OF SHIP	SHIP TYPE	FEMALE CREW	MALE CREW	TOTAL CREW
12	USS CAMDEN	OILER	69	576	645
13	USS L.Y. SPEAR	SUBMARINE TENDER	394	1,038	1,432
14	USS KISKA	AMMUNITION SHIP	75	321	396
15	USS LASALLE	MISC COMMAND SHIP	56	403	459
16	USS SIMON LAKE	SUBMARINE TENDER	338	793	1,131
17	USS MONONGAHELA	OILER	97	195	292
18	USS GRASP	SALVAGE SHIP	27	87	114
19	USS EISENHOWER	AIRCRAFT CARRIER (NUCLEAR PROP)	524	4,476	5,000
20	USS SUPPLY	FAST COMBAT SUPPORT SHIP	7	594	601
21	USS JOHN YOUNG	DESTROYER	24	306	330
22	USS RAINIER	FAST COMBAT SUPPORT SHIP	74	507	581
23	USS CURTIS WILBUR	DESTROYER	23	328	351
24	USS CORONADO	MISC COMMAND SHIP	55	549	604
25	USS CAPE COD	DESTROYER TENDER	424	1,145	1,569
26	USS MOUNT HOOD	AMMUNITION SHIP	96	329	425
27	USS COMSTOCK	DOCK LANDING SHIP	37	298	335
28	USS FLINT	AMMUNITION SHIP	90	309	399
29	USS MAUNA KEA	AMMUNITION SHIP	27	287	314
30	USS CIMARRON	OILER	53	149	202
31	USS WILLAMETTE	OILER	71	167	238
32	USS SAFEGUARD	SALVAGE SHIP	25	78	103
33	USS SALVOR	SALVAGE SHIP	23	81	104
34	USS YELLOWSTONE	DESTROYER TENDER	425	946	1,371
35	USS MT. WHITNEY	AMPHIBIOUS COMMAND SHIP	79	616	695
36	USS EMORY S. LAND	SUBMARINE TENDER	457	1,069	1,526
37	USS HOLLAND	SUBMARINE TENDER	360	1,021	1,381

	NAME OF SHIP	SHIP TYPE	FEMALE CREW	MALE CREW	TOTAL CREW
38	USS SACRAMENTO	FAST COMBAT SUPPORT SHIP	68	546	614
	TOTALS		**6,072**	**23,326**	**29,398**

A total of 38 ships, as indicated in Table 5, were surveyed from a total of 74 eligible ships during year one. Table 6 indicates 22 ships which were surveyed corresponding to the response rates by gender. The discrepancy between the number of ships listed in Tables 5 and 6 is accounted for by the dates of collection; 30 OCT 1995 being the cutoff date for the inclusion of 27 ships in the U.S. Navy Shipboard Health Survey Development. In addition, 5 ships were excluded from the survey as a result of low response rates (<40%), yielding a total of 22 ships.

Table 6. Ships Surveyed Using U.S. Navy Shipboard Health Survey, Number of Surveys, and Response Rates by Gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 30 OCT 1995.

	NAME OF SHIP (HULL NUMBER)	NUMBER OF PERSONNEL ASSIGNED			PERSONNEL PARTICIPATING					
					WOMEN		MEN *		TOTAL	
		WOMEN	MEN	TOTAL	No.	%	No.	%	No.	%
1	USS PLATTE (AO 186)	85	183	268	43	50.6	28	32.9	71	41.8
2	USS SHENANDOAH (AD 44)	497	1,041	1,538	244	49.1	237	47.7	481	48.4
3	USS GRAPPLE (ARS 53)	36	67	103	31	86.1	33	91.7	64	88.9
4	USS SANTA BARBARA (AE 28)	87	290	377	61	70.1	68	78.2	129	74.7
5	USS MOUNT BAKER (AE 34)	72	292	364	35	48.6	44	61.1	79	54.9
6	USS BARRY (DDG 53)	19	319	338	18	94.7	20	105.3	38	*97.4
7	USS DIXON (AS 37)	397	981	1,378	210	52.9	184	46.3	394	49.6
8	USS CAMDEN (AOE 2)	69	576	645	54	78.3	71	102.9	125	*89.1
9	USS L. Y. SPEAR (AS 36)	394	1,038	1,432	194	49.2	152	38.6	346	43.9
10	USS KISKA (AE 35)	75	321	96	55	73.3	19	25.3	74	49.3

	NAME OF SHIP (HULL NUMBER)	NUMBER OF PERSONNEL ASSIGNED			PERSONNEL PARTICIPATING					
					WOMEN		MEN *		TOTAL	
		WOMEN	MEN	TOTAL	No.	%	No.	%	No.	%
11	USS MONONGAHELA (AO 178)	97	195	292	59	60.8	58	59.8	117	60.3
12	USS GRASP (ARS 51)	27	87	14	24	88.9	23	85.2	47	87.0
13	USS SUPPLY (AOE 6)	7	594	601	7	100.0	7	100.0	14	100.0
14	USS CURTIS WILBUR (DDG 654)	23	328	351	20	87.0	25	108.7	45	*93.5
15	USS CORONADO (AGF 11)	55	549	604	28	50.9	40	72.7	68	61.8
16	USS CAPE COD (AD 43)	424	1,145	1,569	218	51.4	301	71.0	519	61.2
17	USS MOUNT HOOD (AE 29)	96	329	425	63	65.6	65	67.7	128	66.7
18	USS COMSTOCK (LSD 45)	37	298	335	30	81.1	26	70.3	56	75.7
19	USS RAINIER (AOE 7)	74	507	581	58	78.4	51	68.9	109	74.3
20	USS YELLOWSTONE (AD 41)	425	946	1,371	287	67.5	252	59.3	539	63.4
21	USS EMORY S. LAND (AS 39)	457	1,069	1,526	307	67.2	319	69.8	626	68.5
22	USS HOLLAND (AS 32)	360	1,021	1,381	121	33.6	118	32.8	239	33.2
	TOTALS	**3813**	**12176**	**15989**	**2167**		**2141**		**4308**	
	MEDIAN					**67.4**		**69.4**		**65.1**

*One to one match, with two men eligible for each woman; participating percentage greater than 100.00 indicates more men participating at their request than originally selected. Total percentages do not take into account the additional men participating in the survey.

Table 7. Ships Surveyed Using U.S. Navy Shipboard Health Survey, Anonymous Supplemental Health and Behavioral Survey, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	NAME OF SHIP (HULL NUMBER)	NUMBER OF PERSONNEL ASSIGNED			PERSONNEL PARTICIPATING		
		WOMEN	MEN	TOTAL	TARGET	ACTUAL (MEN+WOMEN)	%
1	USS PLATTE (AO 186)	85	183	268	170	69	41
2	USS SHENANDOAH (AD 44)	497	1,041	1,538	994	498	50
3	USS GRAPPLE (ARS 53)	36	67	103	72	64	89
4	USS SANTA BARBARA (AE 28)	87	290	377	174	131	75
5	USS MOUNT BAKER (AE 34)	72	292	364	144	73	51
6	USS BARRY (DDG 53)	19	319	338	38	38	100
7	USS DIXON (AS 37)	397	981	1,378	794	401	51
8	USS CAMDEN (AOE 2)	69	576	645	138	128	93
9	USS L. Y. SPEAR (AS 36)	394	1,038	1,432	788	355	45
10	USS KISKA (AE 35)	75	321	96	150	78	52
11	USS MONONGAHELA (AO 178)	97	195	292	194	112	58
12	USS GRASP (ARS 51)	27	87	14	54	48	89
13	USS SUPPLY (AOE 6)	7	594	601	14	12	86
14	USS CURTIS WILBUR (DDG 654)	23	328	351	46	41	89
15	USS CORONADO (AGF 11)	55	549	604	110	66	60
16	USS CAPE COD (AD 43)	424	1,145	1,569	848	532	63

	NAME OF SHIP (HULL NUMBER)	NUMBER OF PERSONNEL ASSIGNED WOMEN	MEN	TOTAL	PERSONNEL PARTICIPATING TARGET	ACTUAL (MEN+WOMEN)	%
17	USS MOUNT HOOD (AE 29)	96	329	425	192	171	89
18	USS COMSTOCK (LSD 45)	37	298	335	74	55	74
19	USS RAINIER (AOE 7)	74	507	581	148	128	86
20	USS YELLOWSTONE (AD 41)	425	946	1,371	850	544	64
21	USS EMORY S. LAND (AS 39)	457	1,069	1,526	914	640	70
22	USS HOLLAND (AS 32)	360	1,021	1,381	720	252	35
	TOTALS	**3813**	**12176**	**15989**	**1,718**	**1,214**	
	MEDIAN						**86**

3.1.2 Sick Call Data Obtained.

Medical encounter data was obtained from the 53 ships listed in Table 8. The source or sources of data and the period of collection is also listed by ship.

Table 8. Sick Call Encounters by Ship and Source of Encounter, U.S. Navy Women board Ship Study, 15 NOV 1994 - 31 DEC 1995.

	NAME OF SHIP	PERIOD AND SOURCE OF ENCOUNTER DATA SAMS	SICK CALL LOG
1	USS PLATTE	11/01/94 - 11/30/95	
2	USS SHENANDOAH	08/95	
3	USS GRAPPLE	11/01/95 - 06/30/95	
4	USS SANTA BARBARA	01/01/95 - 07/31/95	
5	USS MOUNT BAKER		08/23/95 - 09/30/95
6	USS BARRY	01/01/95 - 07/31/95	
7	USS FRANK CABLE		08/11/95 - 09/30/95
8	USS DIXON	01/01/93 - 05/31/95	06/05/95 - 09/08/95

	NAME OF SHIP	PERIOD AND SOURCE OF ENCOUNTER DATA	
		SAMS	SICK CALL LOG
9	USS DETROIT		08/31/95 - 09/30/95
10	USS MERRIMACK	09/01/94 - 11/30/95	06/01/95 - 09/30/95
11	USS SHASTA	01/01/93 - 06/30/95	
12	USS MCKEE		10/15/95 - 09/30/95
13	USS CAMDEN	01/01/93 - 08/31/95	
14	USS L. Y. SPEAR		09/12/95 - 09/30/95
15	USS KISKA		06/08/95 - 09/08/95
16	USS LASALLE		09/15/95 - 09/30/95
17	USS SIMON LAKE	08/01/95 - 09/30/95	06/16/95 - 09/29/95
18	USS MONONGAHELA	01/01/95 - 06/30/95	
19	USS GRASP		06/01/95 - 08/31/95
20	USS EISENHOWER		02/12/95 - 05/22/95
21	USS SUPPLY		07/18/95 - 09/30/95
22	USS JOHN YOUNG	04/95	
23	USS CURTIS WILBUR		06/23/95 - 09/30/95
24	USS CORONADO		06/29/95 - 09/30/95
25	USS CAPE COD	01/01/95 - 06/30/95	06/29/95 - 09/11/95
26	USS MOUNT HOOD	01/01/95 - 05/31/95	06/01/95 - 09/06/95
27	USS COMSTOCK	01/01/95 - 08/31/95	
28	USS RAINIER		07/07/95 - 09/30/95
29	USS FLINT		03/09/95 - 09/30/95
30	USS MAUNA KEA		01/01/95 - 03/31/95
31	USS CIMARRON	05/95	
32	USS WILLAMETTE		05/23/95 - 09/30/95
33	USS SAFEGUARD	01/01/95 - 05/31/95	
34	USS SALVOR	01/01/95 - 05/31/95	
35	USS YELLOWSTONE		08/11/95 - 09/30/95
36	USS KEARSARGE		12/30/95 - PRESENT
37	USS MOUNT WHITNEY		11/16/95 - PRESENT

	NAME OF SHIP	PERIOD AND SOURCE OF ENCOUNTER DATA	
		SAMS	SICK CALL LOG
38	USS BRISCOE		12/30/95 - PRESENT
39	USS HAYLER	01/01/95 - 10/31/95	
40	USS LABOON		12/30/95 - PRESENT
41	USS EMORY S. LAND	01/01/95 - 09/30/95	08/01/95 - 09/30/95
42	USS HOLLAND		07/01/95 - 07/31/95
43	USS SACRAMENTO	01/01/92 - 12/31/95	
44	USS PUGET SOUND	04/01/95 - 09/30/95	
45	USS ARCTIC		12/30/95 - PRESENT
46	USS MOOSBRUGGER		12/30/95 - PRESENT
47	USS ASHLAND		07/01/95 - 10/01/95
48	USS TORTUGA	01/01/92 - 12/31/94	06/06/95 - 10/19/95
49	USS ESSEX		01/09/96 - PRESENT
50	USS FORT MCHENRY		12/30/95 - PRESENT
51	USS NIMITZ		11/17/95 - PRESENT
52	USS OLENDORF		TBD
53	USS RUSHMORE	03/01/93 - 01/08/96	01/08/96 - PRESENT

Prototype Analysis of Visit Rates by Category of Illness. Table 9 displays a preliminary analysis of sick call visit rates by category of illness. This data is based on 35,000 visits across 32 ships.

3.1.3 Medical Department Structured Discussion Accomplishments.

Medical department personnel who participated in these discussions served aboard ships where men and women assigned for duty. Table 9 shows the ships and the dates on which the medical department discussions were completed and the categories of medical department personnel who participated in the discussions.

Table 9. Ships Providing Medical Department Guided Discussions, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	NAME OF SHIP (HULL NUMBER)	NUMBER OF PERSONNEL ASSIGNED			DATE OF INTERVIEWS	NUMBER OF PERSONNEL INTERVIEWED*			
		WOMEN	MEN	TOTAL		MC	MSC	NC	HM
1	USS PLATTE (AO 186)	85	183	268	18 JUL 95		1		1
2	USS SHENANDOAH (AD 44)	497	1,041	1,538	21 JUL 95				1
3	USS GRAPPLE (ARS 53)	36	67	103	19 JUL 95				1
4	USS SANTA BARBARA (AE 28)	87	290	377	18 JUL 95				2
5	USS MOUNT BAKER (AE 34)	72	292	364	17 JUL 95				1
6	USS BARRY (DDG 53)	19	319	338	23 AUG 95				1
7	USS FRANK CABLE (AS 40)	308	923	1,231	18 JUL 95	1			1
8	USS DIXON (AS 37)	397	981	1,378	22 MAR 95	1			
9	USS DETROIT (AOE 4)	63	548	611	22 AUG 95				1
10	USS MERRIMACK (AO 179)	90	220	310	15 NOV 95		1		1
11	USS SHASTA (AE 33)	72	340	412	03 APR 95		1		1
12	USS MCKEE (AS 41)	438	1,128	1,566	17 JUL 95	1			
13	USS CAMDEN (AOE 2)	69	576	645	21 AUG 95	2			1
14	USS L. Y. SPEAR (AS 36)	394	1,038	1,432	05 SEP 95	1			
15	USS KISKA (AE 35)	75	321	396	20 OCT 95		1		1
16	USS LASALLE (AGF 3)	56	403	459	13 SEP 95	1			1

	NAME OF SHIP (HULL NUMBER)	NUMBER OF PERSONNEL ASSIGNED			DATE OF INTERVIEWS	NUMBER OF PERSONNEL INTERVIEWED*			
		WOMEN	MEN	TOTAL		MC	MSC	NC	HM
17	USS SIMON LAKE (AS 33)	338	793	1,131	13 SEP 95	1			1
18	USS GRASP (ARS 51)	27	87	114	27 JUN 95				1
19	USS EISENHOWER (CVN 69)	524	4,476	5,000	16 FEB 95 to 22 MAR 95	5	2	3	3
20	USS SUPPLY (AOE 6)	7	594	601	18 JUL 95	1			1
21	USS CURTIS WILBUR (DDG 654)	23	328	351	29 JUN 95				1
22	USS CORONADO (AGF 11)	55	549	604	29 JUN 95	1			
23	USS CAPE COD (AD 43)	424	1,145	1,569	23 MAR 95	2			
24	USS MOUNT HOOD (AE 29)	96	329	425	12 JUN 95		1		
25	USS COMSTOCK (LSD 45)	37	298	335	14 APR 95	1			1
26	USS RAINIER (AOE 7)	74	507	581	06 JUL 95	1			1
27	USS MAUNA KEA (AE 22)	27	287	314	04 APR 95				2
28	USS CIMARRON (AO 177)	53	149	202	22 MAY 95				1
29	USS WILLAMETTE (AO 180)	71	167	238	23 MAY 95				1
30	USS SAFEGUARD (ARS 50)	25	78	103	16 MAY 95				2
31	USS SALVOR (ARS 62)	23	81	104	17 MAY 95				1
32	USS YELLOWSTONE (AD 41)	425	946	1,371	14 JUL 95	2			
33	USS BRISCOE (DD 977)	5	329	334	12 SEP 95				1

	NAME OF SHIP (HULL NUMBER)	NUMBER OF PERSONNEL ASSIGNED			DATE OF INTERVIEWS	NUMBER OF PERSONNEL INTERVIEWED*			
		WOMEN	MEN	TOTAL		MC	MSC	NC	HM
34	USS HAYLER (DD 997)	31	307	338	15 NOV 95				1
35	USS EMORY S. LAND (AS 39)	457	1,069	1,526	18 OCT 95	2			
36	USS SACRAMENTO (AOE 1)	68	546	614	12 DEC 95	1			
37	USS TORTUGA (LSD 46)	26	396	422	15 NOV 95	1			1
	TOTALS	**5,574**	**22,131**	**27,705**		**25**	**7**	**3**	**33**

*MC = Medical Corps, MSC = Medical Service Corps, NC = Nurse Corps, HM = Hospital Corpsman

3.1.4 Report Development.

This section lists the reports in preparation and investigators responsible for each report. (Appendix B contains a detailed literature review, hypotheses to be tested and analysis plans for reports 1 through 11.)

(1) Gender Differences in Health Conditions Among Navy Personnel

Proposed Lead Authors: Deborah Wingard, Ph.D. and Donna Kritz-Silverstein, Ph.D.

Using shipboard questionnaire data and other resources, this report will investigate the prevalence of health conditions and symptoms in young women and men in different ethnic/racial groups aboard Navy ships. It will also examine gender differences in the reporting of specific health conditions and symptoms, as well as in the total number of conditions reported by men and women. Specifically, gender differences in the experience of migraines and other headaches and gender differences in injury rates within specific ratings, will be examined. Comparisons will be made between deployed and non-deployed individuals to determine if deployment has an adverse association with health indicators.

(2) Health Beliefs Model in Shipboard, U.S. Navy Men and Women.

Proposed Lead Author: LT Michael J. Schwerin, MSC, USNR

This report will examine the health behavior of male and female shipboard U.S. Navy personnel in relation to the Health Beliefs Model (Becker, 1974). The report attempts to explain health-seeking behavior by analyzing its relationships to antecedent conditions within the individual. Initially, willingness to seek health care for an illness is influenced by an individual's

perceptions of susceptibility to and severity of the illness. Health seeking action can be triggered by an individual's evaluation of health status. Health-seeking behavior depends upon an individual's estimate of the potential benefits of the behavior in reducing susceptibility or severity. The estimated benefits are then weighed against perceptions of physical, psychological, financial, and other risks; costs; and barriers.

(3) A Comparison of Men and Women Aboard Navy Ships: Life Stress Conditions, Psychosocial Stress, Distress, Coping and Quality of Life Issues.

Proposed Lead Author: James A. Martin, Ph.D., BCD

This report will explore three broad domains of psychosocial research: sources of current psychosocial stress, perceived impact of stressors, and the impact of distress on the performance of military duties and personal life responsibilities. The primary focus will be psychosocial stressors in the work environment aboard ship, and the perceived impact of these stressors on current levels of psychosocial distress. Other military and personal life stressors also will be examined as part of assessment of the overall quality of life of women aboard ship. The report also will examine the impact of distress as it relates to perceived performance of military duties and personal life responsibilities, as well as the impact of distress on objective measures of health, well-being, job performance, and personal life role performance.

(4) Gender Differences in Response to Stress Report.

Proposed Lead Author: Ross R. Vickers, Jr., Ph.D., and James A. Martin, Ph.D., BCD

The objective of this report will be to determine whether there are gender differences in the organization and meaning of common experiences particularly with regard to stress. The report will analyze the associations of gender, marital status, and family composition with variables including stress, job and life satisfaction, health status, and health utilization. The report will explore whether traditional foci may be insensitive to the fact that the same event or circumstance may mean different things to different people.

(5) Comparison of Psychological Symptomatology According to the Brief Symptom Index in Women and Men Aboard Navy Ships, and Comparison with Army Data on Personnel Deployed During Desert Shield and Desert Storm.

Proposed Lead Author: Kathleen M. Wright, Ph.D.

This report will focus on analysis of the Brief Symptom Inventory (BSI), and will be organized into three interrelated areas, each having specific products: establishing gender-based norms for military service members; and collecting prospective longitudinal follow-up data on the effects of shipboard duty and deployment for male and female service members; identifying groups at high- and low-risk for symptoms and relating risk status to other health and performance indicators.

(6) Family Composition: Correlates With Quality of Life, Health, Stress, Coping and Supports of Women Aboard Ship

Proposed Lead Authors: Dorothy J. Jeffreys, Ph.D., Theresa Russo, Ph.D., and Lea Dougherty, M.S.W.

Using questionnaire data primarily from items on family composition, service history, and health status, this report will investigate hypotheses, that health issues for service personnel differ by marital status, family composition, and gender. In addition they vary by length of service, number of deployments, and type of shipboard assignment; and that health and well being of service personnel aboard ship are influenced by the extent of and involvement with support resources (family, friends, and organizations).

(7) Prevalence Rates of Upper Respiratory Disease Symptoms and Reported Shipboard Conditions and Exposures Among Active-Duty Navy Personnel Assigned to Ships.

Proposed Lead Author: Edward D. Gorham, M.P.H.

This report will focus on the upper respiratory tract infections which are the most common infectious diseases in the United States in adults, and pose a considerable health threat to the shipboard population. Many viral agents known to cause acute respiratory illness are transmissible through indoor air. Historically, military populations aggregated for training or deployment have experienced high incidence rates of acute upper respiratory infections (URI), and URI is the leading cause of outpatient illness in active-duty Navy personnel assigned to ships. However, associations between shipboard ventilation and crowding in living spaces with incidence rates of upper respiratory infections are not well defined. This report will assess the relationship between incidence rates of acute URI as determined from sick call visits aboard a Navy aircraft carrier during deployment and ventilation characteristics (including rate of air change in cubic feet per minute, percent fresh air and number of square feet per person, based on personnel berthing assignments).

(8) Demographics, Family Structure, Women's Health, Reproductive Health, and Occupational Exposures of Personnel Participating in the U.S. Navy Women Aboard Ship Study.

Proposed Lead Authors: Frank C. Garland, Ph.D., and David S. Timberlake, M.P.H

This report will provide a summary of the results from the Anonymous Supplemental Health and Behavioral Survey of the U.S. Navy Shipboard Health Survey. The results from this study will include information regarding sexual behavior, birth control, STD prevention, and other topics of a sensitive nature which were not included in the U.S. Navy Shipboard Health Survey.

(9) Pregnancy Among Enlisted Women Aboard Ships.

Proposed Lead Authors: Marie D. Thomas, Ph.D., and Patricia J. Thomas, M.A.

This report will focus on pregnancy, use of contraception, and family planning attitudes. The following topics will be explored: the interrelationships among family planning attitudes, contraceptive behavior, and unplanned pregnancy. In addition, the effects of psychosocial stress and lifestyle behaviors on contraceptive use and rates of pregnancy and contraceptive use for the sample as a whole and within various subgroups will be explored.

(10) Menstrual and Reproductive Health Conditions Among Women in the Navy

Proposed Lead Authors: Donna Kritz-Silverstein, Ph.D., and Deborah Wingard, Ph.D.

This report will describe the prevalence of disorders associated with the menstrual cycle and reproductive system, and time lost from work due to menstrual and reproductive disorders in women aboard Navy ships. Ovulatory and menstrual disturbances have been associated with stress (Merikangas, K.R., Foeldenyi, M., Angst, J., 1993; Carpenter, S.E., 1994). This report will compare the prevalence of disorders related to menstruation and the menstrual cycle and time lost from work by deployment status, pay grade, and rating. Among women who report having experienced symptoms within the previous 90 days, deployed and non-deployed women will be compared in terms of development of new conditions and worsening of existing conditions.

(11) Women Aboard Navy Ships: Life Style Behaviors and Health Promotion Issues

Proposed Lead Author: Terry L. Conway, Ph.D.

Using data from the shipboard questionnaire and comparative data from women ashore and civilian women, this report will investigate life style behaviors such as tobacco and alcohol use, physical activity, and weight management. It will focus primarily on individuals' perceived access to counseling services related to life style and other health-related behaviors (e.g., family planning/birth control methods, stress management, and drug/alcohol abuse counseling).

(12) Shipboard Women's Health Care Provider Perceptions.

Proposed Lead Authors: LT Michael J. Schwerin, MSC, USNR, and Frank C. Garland, Ph.D.

This report will evaluate the perceptions of health care providers relative to the adequacy of human resources, supplies and training in shipboard medical departments. This report will provide results from the guided discussions conducted with the medical department staffs of 36 ships. Areas of focus will include human resources, fiscal and equipment resources, automated data processing resources, logs and records, morbidity and incidence data, health care provider issues, and training and education/health awareness.

(13) Analyses of the Shipboard Automated Medical System (SAMS) and Sick Call Log.

Proposed Lead Author: Cedric F. Garland, Ph.D.

This Study will analyze the sick call visits aboard Navy ships enrolled in the study. Medical encounter data will be obtained from the sick call logs aboard ship for defined time intervals. The design will be similar to that used in a previous study conducted at the Naval Health Research Center (46). Rosters of all personnel aboard the ships will be used to determine denominator data, allowing calculation of sick call visit rates according to diagnosis and gender. Ratios of sick call visit rates between men and women will be compared. The principal diagnoses accounting for sick call visits in both genders will be examined.

(14) USS Dwight D. Eisenhower (CVN 69) Report: Preliminary Report On the Women Aboard Ship Health Survey.

Proposed Lead Authors: Frank C. Garland, Ph.D., D. Stephen Nice, Ph.D., and Susan Hilton, M.A.

This preliminary study will examine survey data that has been collected, as well as data gathered during the guided discussions with the medical department staff of the USS Dwight D. Eisenhower. The USS Eisenhower is of particular interest because it was the first aircraft carrier to deploy with a significant population of women aboard. This was the first ship surveyed in the Women Aboard Naval Ships Study. This preliminary report will include a demographic summary of participants, measures of quality of life and stress, and self-reported occupational exposures. In addition, the preliminary report will include a summary of self-reported medical conditions, measures of patient satisfaction, pregnancy data, an assessment of attitudes towards family planning, and an assessment of perceived ability of medical staff to treat Naval personnel.

3.2 Results II: Preliminary Findings

This section presents brief summaries of results by major topic areas. Full reports appear in Appendix G. These summaries and reports focus on descriptive analyses and are preliminary. Future analyses will explore more detailed testing of hypotheses and the interrelationship of factors.

3.2.1 Major Topic Area: Population Demographics, Family Structure, and Occupational Factors.

Report Summary: Descriptive Tables of Demographic Characteristics, Family Structure, and Women's Health-Related Issues, and Occupational Exposures of Personnel Participating in the U.S. Navy Women Aboard Ship Study (See Appendix G.1).

This report presents demographic and other characteristics of the population participating in the U.S. Navy Women Aboard Ship Study, a project conducted as part of the Defense

Women's Health Research Program. This tabular presentation focuses on 4 topic areas: (1) demographic characteristics, (2) family structure, (3) women's health-related issues, and (4) occupational exposures. The population (n = 4,337) was predominately young (age < 30 years); approximately 50% were white and 30% were black. The population consisted of 93% enlisted personnel, 4.3% warrant officers, and 2.7% officers. The majority of the population, 54.5%, had served 3 years or less aboard ship. The number of years served aboard ship varied by gender, as indicated by 62.6% of women and 46.9% of men having served 3 years or less. Marital status varied by gender; 40.1% of men reported not being currently married compared to 48.8% of women reporting not currently being married. Nearly two-thirds (65%) of married personnel reported having one or more children in their household. For all personnel, 16% of women and 8% of men reported being single parents. Women's health issues addressed in this report covered self-reported medical conditions and availability of Ob/Gyn supplies. The majority of women, 84% reported not having been medically screened prior to deployment. The majority of women agreed that counseling for a range of medically-related issues was available. Availability of protective gear (i.e., gloves, respirators, ear plugs) for use in current job, proper fit of protective gear, use of protective gear when needed, and interference from the gear with ability to perform work are reported.

3.2.2 Major Topic Area: Health Conditions and Health Perceptions.

Report Summary: Gender Differences in Health Conditions Among Navy Personnel. (See Appendix G.2).

Self-reported conditions during the past 30 days were ascertained from men and women aboard 22 ships. Men were matched to the women on work division, department, race, pay grade, occupational rating, and date of birth. Women had significantly higher prevalence rates than men of all conditions except hearing problems and muscle strains and sprains. Common conditions in both genders included upper respiratory symptoms, which were reported by 53% of women and 45% of men, and sinusitis, reported by 37% of women and 29% of men. Migraines were reported by 20% of women and 10% of men, other headaches by 70% of women and 50% of men. Muscle and back symptoms were reported by 20% of both genders. The highest odds ratios for women compared to men were for nausea and vomiting (OR=4.0, 95% CI 3.2-4.8), constipation (OR=3.7, 95% CI 3.0-4.6), dizziness (OR=2.3, 95% CI 2.0-2.8), migraines (OR=2.4, 95% CI 2.0-2.8), and other headaches (OR=2.2, 95% CI 2.0-2.8). There were few significant differences in prevalence rates among women in different enlisted grades, but heat exhaustion and menstrual problems were more frequent in women in lower than higher grades. Enlisted women had significantly higher prevalence rates than women officers for dizziness, chills, cough, fever, constipation, back problems, migraines, and menstrual conditions. Black women reported psychological/personal problems more frequently than white women, and white women reported sore throats, strains and sprains, sinusitis, migraines, and other headaches more frequently than black women.

Report Summary: **Menstrual and Reproductive Health Conditions Among Women in the Navy. (See Appendix G.3).**

Self-reported menstrual and reproductive health conditions during the past 90 days and irregular menstrual periods during the past 12 months were ascertained by questionnaire from 2,167 women aboard 22 ships. Thirty-seven percent of respondents had irregular menstrual periods during the past 12 months. During the past 90 days, 25% reported heavy periods and 27% reported cramps or pain during periods severe enough to require time away from work or medication. Sixteen percent reported bleeding between periods, and 15% had periods lasting more than one week. Many (20%) reported abdominal pain from unknown causes, and some reported pain from cysts (7%) or endometriosis (4%). For each symptom reported, 5% or fewer women reported first noticing the symptom while aboard ship, but 7% reported that heavy periods worsened aboard ship. Eleven percent of women reported that they needed to take two or more hours away from work during the past 90 days due to menstrual symptoms. Prevalence rates of menstrual symptoms tended either to decline significantly with age (bleeding between periods, cramps during periods, periods lasting longer than one week, and abdominal pain of unknown cause) or to remain constant (heavy periods, abdominal pain from cysts), with the exception of irregular periods during the past 12 months, which occurred at a dramatically higher rate (71%) at 35 years and older. There were few differences in age-adjusted prevalence rates by pay grade, but serious cramps and pain during periods were less prevalent in women officers than enlisted women (OR=0.4, 95% CI 0.2-0.9). There were few differences in age-adjusted prevalence rates according to race, but abdominal pain from cysts was more prevalent in black than white women (OR=1.7, 95% CI 1.2-2.5).

Report Summary: **Health Beliefs Model in Shipboard U.S. Navy Men and Women. (See Appendix G.4).**

A matched sample of men and women in the U.S. Navy (N = 1,064) were examined in a study of shipboard health care utilization. The instrument used in this study is based on the Health Beliefs Model (HBM). The HBM attempts to explain health-seeking behavior by describing the antecedent conditions within the individual. Preliminary chi-square results indicate statistically significant gender differences in health care utilization. Multivariate Analysis of Variance (MANOVA) results indicated that women reported significantly greater ratings of health value, greater rating of perceived illness (compared to people their own age), greater perceived susceptibility to health problems, and greater perceived susceptibility to serious illness than men. Separate discriminant function analyses were employed for males and females. Results for each separate discriminant function analysis yielded a single statistically significant function for females only. Implications of these findings and the efficacy of the HBM are discussed.

Report Summary: **Prevalence Rates of Upper Respiratory Disease Symptoms and Reported Shipboard Conditions and Exposures among Active-Duty Navy Personnel Assigned to Ships. (See Appendix G.5).**

Upper respiratory tract infection (URI) is the leading cause of outpatient morbidity in Navy personnel assigned to ships. However, associations between risk of URI and specific shipboard living conditions such as occupational exposures to exhaust and dust, berthing and work place occupancy, and prevalence rates of current smoking are not well defined. This preliminary report contains descriptive analyses of reported prevalence of cold and sinus symptoms as well as shipboard conditions which may be associated with URI. The overall prevalence rates of cold symptoms experienced over the previous 30 days was 54% in women and 45% in men. The overall prevalence rate of sinus symptoms was 37% in women and 29% in men. The median number of people sharing berthing spaces was 50 among the junior and mid-level enlisted pay grades and 24 among senior enlisted. The median number of people sharing work places was 8-12 and was similar across enlisted ranks, although the median was slightly lower among the most senior enlisted. Officers had about half the work place occupancy as enlisted personnel. Exposure to diesel exhaust within fifty feet was reported 53% more commonly in men (23%) than women (15%). Exposure to dust and particles was reported about equally commonly in men and women, with an overall exposure rate of 50%. Prevalence rates of current smoking were approximately 36% in men and 33% in women. The preliminary analyses in this descriptive study will allow testing of the associations between URI symptoms and potential risk factors associated with major aspects of shipboard life.

3.2.3 Major Topic Area: Psychosocial Factors.

Report Summary: **Comparison of Men and Women Aboard U.S. Navy Ships: Life Stress Conditions, Psychosocial Stress, Distress, Coping and Quality of Life Issues. (See Appendix G.6).**

Military women are among the largest groups of women in our society involved in nontraditional employment. Selected military duty issues and aspects of military life are examined. These data represent the initial nine months of data collection in a comprehensive longitudinal study of health issues. Because of questionnaire length considerations, four alternate questionnaire versions were administered to a total of 2,167 women chosen randomly based on their social security numbers. The psychosocial measures used in this report were administered in two of the four questionnaires for a total of 50% of the overall sample of women and a matched sample of men. The current analysis includes 1,064 women and 1,039 men. The overall median response rate for women was 67.4%. Life stress conditions, perceived stress, duty and personal life performance, coping, psychological distress, and quality of life variables are examined in both descriptive and multivariate analyses. While there are some gender differences, the most important differences are among rank groups. Certain aspects of assignment to

shipboard status and various duty issues are associated with substantial perceived stress, high levels of psychological distress, and reduced well-being for both men and women. Participants are generally positive about the personal and family aspects of their overall quality of life.

Report Summary: Family Composition: Correlates with Quality of Life, Health, Stress, and Coping of Women Aboard Ship. (See Appendix G.7).

This report examines and compares the life of Navy women and men assigned to ships. Family composition and age of children are examined to determine their effect on the service member's quality of life, health, distress, stress, coping ability and support. Service women were matched with service men on ship, occupation aboard ship, department, race/ethnicity, pay grade, and date of birth. The eligible population included all service members assigned to 22 ships in 1994-1995. The median response rate for women was 67%. Participants were generally satisfied with their overall quality of life. However, family composition was associated with quality of life, distress, child and relationship stress and coping ability. Age of the children was associated with the woman's satisfaction with her job, her emotional problems, stress with children, and ability to cope. Satisfaction with spouse, distress, relationship and child stress differed significantly by gender. Family was rated as the most helpful source of support.

Military-induced family separation is the major dissatisfaction with military life and is very stressful for military families. Symptoms of stress related to separation include increased physical illness, low frustration tolerance, and social isolation.

Deployment-related issues for women are of particular importance to the military. Women may face more stress-related illnesses than men due to feeling pressure to prove themselves, role conflict to perform like men, and the need to conform to standards of femininity held by men. Little is known about how the military member deals with separation from family and the influence this may have on health.

Report Summary: Comparison of Psychological Symptomatology According to the Brief Symptom Index in Women and Men Aboard Navy Ships, and Comparison with Army Data on Personnel Deployed During Operations Desert Shield and Desert Storm. (See Appendix G.8).

This report describes the results of administration of the Brief Symptom Inventory (BSI) aboard U.S. Navy ships as a part of the US. Navy Women Aboard Ships Study. The BSI is a standardized instrument that measures psychological symptoms such as anxiety, depression, and hostility. It was administered to a 20% probability sample of women aboard 22 US. Navy ships during 1994-1995 and a comparison group of men, matched to the women on ship, work division, department, race (white, black, Hispanic, or other), pay grade, occupational rating, and date of birth. Overall, women scored significantly

higher than men on depression ($p < .05$), interpersonal sensitivity ($p < .001$), psychological trauma ($p < .01$) subscales, and on an index of general severity of psychological symptoms ($p < .05$). Women who had never deployed had significantly higher scores than men who had not deployed on anxiety ($p < .05$), depression ($p < .01$), interpersonal sensitivity ($p < .001$), somatization ($p < .01$), psychological trauma ($p < .01$), and general severity of symptoms ($p < .05$). By contrast, women who had previously deployed did not differ significantly from men who had previously deployed on any subscale or index. An exception to this was that women with a history of deployment to Somalia who had higher scores on the personal sensitivity subscale ($p < .05$) than men with a history of deployment there.

Report Summary: Exploration of Stress Differences by Gender Aboard U.S. Navy Ships. (See Appendix G.9).

Recent U.S. Navy policy has assigned more women to shipboard duty. If women experience or react to shipboard duty differently than men, then shipboard stress levels should vary according to gender ratio. This paper addresses two indicators of shipboard stress. First, is the structure of perceived stress the same for both genders? Second, are the emotional consequences of stress the same for both genders? A negative answer to the first question would indicate the presence of beta gender differences in stress. A negative answer to the second question would indicate the presence of gamma differences in stress. Structural modeling indicated the following: (a) Stress could best be represented by a 3-dimensional model comprising general life stress dimension, a shipboard living conditions dimension, and a job stress dimension; (b) Only overall life stress was related to distress; (c) There were no significant differences between women and men on these dimensions. The results indicated that neither beta nor gamma differences were present. This outcome simplifies the study of shipboard stress by indicating that as few as three dimensions can summarize a wide variety of specific stressful conditions and that the same stress model can be applied to women and men. The results also raise important questions to direct future investigation, e.g., does the general stress dimension reflect the effects of attributes of the person (e.g., personality) or differences in career factors (e.g., occupational specialty). Another important question is whether living conditions and job stresses have effects on variables which were not measured in this study (e.g., reenlistment rates, performance ratings). The present study provides measurement models that can be used to compare levels of stress between women and men aboard ship and to test the hypotheses about the sources and consequences of those stresses. While additional studies should be sensitive to the possibility that women and men differ in reactions to stress that were not investigated in this study, the results to this time suggest that a single stress model applies to both genders.

3.2.4 Major Topic Area: Health Care Delivery Aboard Ship.

Report Summary: Shipboard Women's Health Care: Health Care Provider Perceptions. (See Appendix G.10).

Women have served aboard auxiliary U.S. Navy ships, as integrated members of the shipboard work force, since 1978. In 1994, women first started serving aboard combatant ships with the infusion of women into the work force of USS DWIGHT D. EISENHOWER (CVN-69). The provision of the highest standard of medical care for both men and women is a priority at all levels in the U.S. Navy. This study is a process evaluation from the perspective of shipboard health care providers. This evaluation was performed by conducting a personal interview with the senior health care provider of each of 32 ships where women are integrated members of the work force. Medical department representatives reported that most ships have training programs for birth control (90.6%), sexually transmitted diseases (96.9%), and Navy pregnancy policy (84.4%). Health care providers also reported perceived limitations in the lack of personnel and fiscal resources, gynecological training, and inadequate or inappropriate supplies (i.e., contraceptives, pregnancy tests, and sexually transmitted disease tests).

3.2.5 Major Topic Area: Pregnancy and Related Issues.

Report Summary: Pregnancy Among Enlisted Women Aboard Ships. (See Appendix G.11).

Demographic correlates of pregnancy, and pregnancy rates, outcomes, and planning, were studied in a sample of 2,032 Navy enlisted women. Survey data were weighted to reflect the distribution of pay grades within the ships' population of women. The pregnancy rate was significantly below previously reported rates for Navy women, and was related to age. Women who became pregnant while assigned to a ship were more likely than those assigned to shore to report that their pregnancy had been unplanned.

3.2.6 Major Topic Area: Health Promotion, Wellness, and Life Style Issues.

Report Summary: Women Aboard U.S. Navy Ships: Life Style Behaviors and Health Promotion Issues. (See Appendix G.12).

The Department of Defense has advanced vigorous health promotion efforts emphasizing healthful life styles and reduction of health risks as a way to enhance military readiness and the quality of life of military personnel. This report presents findings from a comprehensive epidemiological study of women aboard Navy ships conducted at the Naval Health Research Center in San Diego, California. Information is provided on life style behaviors and perceived access to health promotion services. Comparisons are also made between shipboard women and their male shipmates. Age, education, race/ethnicity,

marital status, and officer-enlisted status were significantly associated with most life style variables. A majority of shipboard women agreed that most health promotion services were readily available to them, with birth control services perceived as most available and counseling on weight control and stress management as least available. Significant gender differences were found for the majority of variables examined. The current study of shipboard personnel provides a unique opportunity to extend previous research and provide current information related to beneficial and detrimental health behavior among Navy shipboard women.

3.2.7 Major Topic Area: Sick Call Visits.

Report Summary: Epidemiology of Sick Call Visits Aboard U.S. Navy Ships. (See Appendix G.13).

This study is an analysis of sick call visit aboard 23 Navy ships. Data on medical encounters were obtained by electronic data transfer of automated sick call logs aboard 12 ships and by key-entering special research sick call logs maintained aboard 11 ships for defined time intervals during 1994-1995. The design was similar to that used in a previous study conducted at the Naval Health Research Center (Nice DS, Hilton SM. Sex differences in health care requirements aboard U.S. Navy ships. Naval Health Research Center Technical Report No. 90-2, San Diego CA: NHRC, 1990). All diagnoses were coded using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). Diagnoses are reported here by gender for broad diagnostic categories. Rosters of all personnel aboard the ships were obtained for denominator data, allowing calculation of monthly sick call visit rates per 1,000 crew members according to diagnosis and gender. The principal reasons for sick call visits in women (with visit rates per 1,000 person-months in parentheses) were health services (79.1), injuries (63.5), diseases of the respiratory system (59.5), infectious and parasitic diseases (36.8) and genitourinary disorders (29.2). Health services included general medical examinations, visits for contraceptive management, Papanicolaou smears, and visits associated with pregnancy testing and normal pregnancies. The principal reasons for sick call visits in men were injuries (56.1), diseases of the respiratory system (38.9), health services (26.6), diseases of the skin (21.7) and infectious and parasitic diseases (21.0). There were substantial differences in sick call visit rates between women and men, with an overall ratio of 1.8 visits by women for each visit by men, identical to the ratio previously reported by Nice and Hilton.

3.2.8 Major Topic Area: USS DWIGHT D. EISENHOWER (CVN-69) Preliminary Report on the Women Aboard Ship Health Survey.

Report Summary: USS DWIGHT D. EISENHOWER (CVN-69). (See Appendix G.14).

USS DWIGHT D. EISENHOWER was the first combatant ship in the Navy to deploy with women aboard, and was included during February-March 1995 as the first ship to participate in the U.S. Navy Women Aboard Ship Study. Self-administered questionnaires were completed by 82% (N=187) of women aboard and a sample of men (N=187) matched to the women on work division, department, race, pay grade, occupational rating, and date of birth. Women and men aboard ship reported similar and relatively high levels of satisfaction with their quality of life. General shipboard stress was higher in women in junior pay grades than those in senior pay grades. Women in lower pay grades reported more career stress than those in higher pay grades. There were no differences in personal stress by pay grade or gender, although depressive symptoms were more common in lower pay grades than in higher pay grades. Depression was reported by approximately 10% of women and 8% of men at the beginning of deployment, and did not increase during deployment. Menstrual disorders were reported by 8% of women at the beginning of deployment, and increased to 16% during deployment. Half the women aboard experienced symptoms characteristic of premenstrual syndrome during the past 90 days, and 16% reported that they lost two or more hours of work during the past 30 days due to menstrual conditions. The most commonly reported occupational exposures in both genders were to noise, lifting heavy objects, and paint. When asked about the likelihood of pregnancy, approximately 10% of women reported that they had a 75-100% probability of becoming pregnant during the next 12 months and 73% reported zero probability of becoming pregnant during the next 12 months. Crew members reported that they generally felt comfortable seeking birth control information from the medical department. Interviews with medical department staff indicated that 55% reported a need for more gynecological training, 36% reported a need for additional supplies for birth control, and 45% reported a need for more private space for examinations.

4.0 PLANS

The second year of the study will focus on enrollment of women newly serving aboard ship and a longitudinal follow up of the population at a one year interval. The report topic areas developed during year one of the study will be explored in greater depth in year two, with an increased focus on hypothesis testing and with particular sensitivity to apparently emerging inter-relatedness of multiple factors.

The following table (Table 10) lists ships which have been identified as candidates for enrollment in the U.S. Navy Shipboard Health Survey during the period 01 February 1996 through 30 September 1996.

Table 10. Candidate Ships for FY 96 Enrollment and Survey, U.S. Navy Women Aboard Ship Study, 01 FEB 1996 - 30 SEP 1996.

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	NUMBER OF PERSONNEL ASSIGNED		
			FEMALE	MALE	TOTAL
1	USS MERRIMACK (AO 179)	OILER	90	220	310
2	USS WASP (LHD 1)	AMPHIBIOUS ASSAULT (MP)	7	1,197	1,204
3	USS KEARSARGE (LHD 3)	AMPHIBIOUS ASSAULT (MP)	7	1,196	1,203
4	USS SAIPAN (LHA 2)	AMPHIBIOUS ASSAULT (MP)	6	1,194	1,200
5	USS NASSAU (LHA 4)	AMPHIBIOUS ASSAULT (MP)	4	1,197	1,201
6	USS BRISCOE (DD 977)	DESTROYER	5	329	334
7	USS HAYLER (DD 997)	DESTROYER	31	307	338
8	USS LABOON (DDG 58)	GUIDED MISSILE DESTROYER	12	316	328
9	USS ABRAHAM LINCOLN (CVN 72)	AIRCRAFT CARRIER (NP)	273	4,600	4,873
10	USS BUTTE (AE 27)	AMMUNITION SHIP	43	373	416
11	USS PUGET SOUND (AS 37)	DESTROYER TENDER	419	1,055	1,474
12	USS SEATTLE (AOE 3)	FAST COMBAT SUPPORT SHIP	79	461	540
13	USS ARCTIC (AOE 8)	FAST COMBAT SUPPORT SHIP	99	429	528
14	USS MOOSBRUGGER (DD 980)	DESTROYER	24	365	389
15	USS ASHLAND (LSD 48)	AMPHIBIOUS DOCK LANDING SHIP	32	362	394

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	NUMBER OF PERSONNEL ASSIGNED		
			FEMALE	MALE	TOTAL
16	USS TORTUGA (LSD 46)	AMPHIBIOUS DOCK LANDING SHIP	26	396	422
17	USS GUNSTON HALL (LSD 44)	AMPHIBIOUS DOCK LANDING SHIP	7	395	402
18	USS GEORGE WASHINGTON (CVN 73)	AIRCRAFT CARRIER (NP)	2	4,998	5,000
19	USS STENNIS (CVN 74)	AIRCRAFT CARRIER (NP)	243	4,513	4,756
20	USS JOHN F. KENNEDY (CV 67)	AIRCRAFT CARRIER	97	4,476	4,573
21	USS BELLEAU WOODS (LHA 3)	AMPHIBIOUS ASSAULT (MP)	4	982	986
22	USS BENFOLD (DDG 83)	DESTROYER	18	308	326
23	USS CONSTELLATION (CV 64)	AIRCRAFT CARRIER	2	3,083	3,085
24	USS DAVID R. RAY (DD 971)	DESTROYER	2	357	359
25	USS ESSEX (LHD 2)	AMPHIBIOUS ASSAULT	5	1,170	1,175
26	USS FLETCHER (DD 992)	DESTROYER	20	339	359
27	USS FORT MCHENRY (LSD 43)	AMPHIBIOUS DOCK LANDING SHIP	27	334	361
28	USS KINKAID (DD 965)	DESTROYER	22	337	359
29	USS NIMITZ (CVN 68)	AIRCRAFT CARRIER (NP)	210	3,177	3,387
30	USS OLENDORF (DD 972)	DESTROYER	1	358	359
31	USS PAUL FOSTER (DD 964)	DESTROYER	22	337	359

	NAME OF SHIP (HULL NUMBER)	SHIP TYPE	NUMBER OF PERSONNEL ASSIGNED FEMALE	MALE	TOTAL
32	USS PELELIU (LHA 5)	AMPHIBIOUS ASSAULT (MP)	6	980	986
33	USS RUSHMORE (LSD 47)	AMPHIBIOUS DOCK LANDING SHIP	1	1,174	1,175
34	USS TARAWA (LHA 1)	AMPHIBIOUS ASSAULT (MP)	5	981	986
35	USS MILIUS (DDG 69) (PCU)	GUIDED MISSILE DESTROYER	1	325	326
36	USS KITTY HAWK (CV 63)	AIRCRAFT CARRIER	20	3,065	3,085
	TOTALS		**1,872**	**45,686**	**47,558**

Table 11. Candidate Ships for FY96 Collection of Sick Call Data, U.S. Navy Women Aboard Ship Study, 01 FEB 96 - 30 SEP 96.

	NAME OF SHIP	PERIOD AND SOURCE OF ENCOUNTER DATA SAMS	SICK CALL LOG
1	USS WASP		TBD
2	USS SAIPAN		TBD
3	USS NASSAU		TBD
4	USS ABRAHAM LINCOLN		TBD
5	USS BUTTE		TBD
6	USS SEATTLE		TBD
7	USS GUNSTON HALL		TBD
8	USS GEORGE WASHINGTON		TBD
9	USS STENNIS		TBD
10	USS JOHN F. KENNEDY		TBD
11	USS BELLEAU WOODS		TBD
12	USS BENFOLD		TBD
13	USS CONSTELLATION		TBD
14	USS DAVID R. RAY		TBD

	NAME OF SHIP	PERIOD AND SOURCE OF ENCOUNTER DATA	
		SAMS	SICK CALL LOG
15	USS FLETCHER		TBD
16	USS KINKAID		TBD
17	USS OLENDORF		TBD
18	USS PAUL F. FOSTER		TBD
19	USS PELELIU		TBD
20	USS TARAWA		TBD
21	USS KITTY HAWK		TBD
22	USS MILIUS		TBD

5.0 CONCLUSIONS

The first year of this study met the objectives of obtaining self-reported information from a large portion of women and a sample of men serving aboard ship, obtaining sick call information, and conducting structured interviews with shipboard medical department staff. This success was in large measure due to the strong support of all levels of the Navy line as well as the strong support and active efforts of the Navy medical community. Women and men took time from their busy, high-tempo lives aboard ship to fill out questionnaires for this study with a friendly, good-natured attitude.

Year one of this study has begun to address the basic questions concerning health and psychosocial aspects of women serving aboard ship during a period of rapid change. The component studies of this project are yielding many important insights into these complex issues. This study is providing interrelated information on a wide variety of topics to insure optimal health and readiness and facilitate decision making for policy development.

The second year of the study will focus on enrollment of women newly serving aboard ship and a longitudinal follow-up of the population at a one-year interval. The reports developed during year one of the study provide the foundation for continuing in-depth studies that are currently underway.

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APPENDICES

A. Briefings and Presentations, Workshops

B. Report Topics and Analysis Plans

C. Health Data Collection Instruments

D. Medical Department Structured Discussions

E. Department of the Navy (DoN) Pregnancy Policy

F. Congressional Recommendations

G. Results

APPENDIX A

Briefings and Presentations, Workshops

BRIEFINGS/PRESENTATIONS

12 September 1994, Washington D.C., briefing by Frank C. Garland, PhD.
RADM J.H. Black
Fleet Surgeon, US Atlantic Fleet
CAPT N.Dean
Force Medical Officer, COMNAVSURFLANT
CAPT Warlick
Force Medical Officer, COMNAVSUBLANT
CAPT Frazier
Force Medical Officer, COMNAVAIRLANT
"Women Aboard U.S. Navy Ships: A Comprehensive Health and Readiness Research Project"

12 October 1994, Washington D.C., briefing by Frank C. Garland, Ph.D.
The Process Action Team (PAT) on Women's Issues
Bureau of Medicine and Surgery
"The Defense Women's Health Research Program at The Naval Health Research Center"

12 October 1994, Washington D.C., briefing by Frank C. Garland, Ph.D.
CAPT S. Clemens
Special Assistant for Women's Policy, Bureau of Naval Personnel

13-14 October 1994, Washington D.C., briefing by Frank C. Garland, Ph.D.
CAPT T.G. Patel
Director, Surface Medicine, Bureau of Medicine and Surgery

06 December 1994, Pensacola, Florida, briefing by Frank C. Garland, Ph.D.
Naval Aeromedical Problems Course
Naval Aerospace & Operational Medical Institute

12 January 1995, San Diego, California, briefing by Frank C. Garland, Ph.D.
CAPT R.J. Lentz
Force Medical Officer, COMNAVAIRPAC
"Women Aboard U.S. Navy Ships: A Comprehensive Health and Readiness Research Project"

17 January 1995, San Diego, California, briefing by Frank C. Garland, Ph.D.
CAPT J.H. Fahey
Force Medical Officer, COMNAVSURFPAC
"Women Aboard U.S. Navy Ships....".

BRIEFINGS /PRESENTATIONS

09 February 1995, Norfolk, Virginia, briefing by LDCR Lisa Meyer and LT Michael Schwerin

CAPT James Fraser, COMNAVAIRLAND Force Medical officer
CDR Dave Shively
LCDR Scott Shappell
"U.S. Navy Shipboard Health Study: A Comprehensive Health and Readiness Research Project"

09 February 1995, Norfolk, Virginia, briefing by LCDR Lisa Meyeer and LT Michael Schwerin

CAPT Louis Lalli, COMNAVAIRLANT Chief of Staff
"U.S. Navy Shipboard Health Study: A Comprehensive Health and Readiness Research Project"

14-16 February 1995, Pearl Harbor, Hawaii, briefing by Frank C. Garland, Ph.D.

RADM D. Frost
Surgeon, CINCPAC
CAPT K. Andrus
Fleet Surgeon, US Pacific Fleet
CAPT J. Murray
Force Medical Officer, COMNAVSUBPAC
Fleet Marine Force, Pacific Representative

03 April 1995, San Diego, California, briefing by Frank C. Garland, Ph.D.

Dr. S. Joseph
Assistant Secretary of Defense for Health Affairs

12 April 1995, San Diego, California, briefing by Frank C. Garland, Ph.D.

CAPT R. Carter
Director of Research & Development, Naval Medical Research & Development Command

16 May 1995, San Diego, California, briefing by Frank C. Garland, Ph.D.

CAPT T.G. Patel
Director, Surface Medicine, Bureau of Medicine and Surgery

06-08 June 1995, Brussels, Belgium, briefing by Frank C. Garland, Ph.D.

1995 Conference of Women in NATO Forces
"The Defense Women's Health Research Program in the Navy: An Overview"

BRIEFINGS/PRESENTATIONS

02 November 1995, Portsmouth, Virginia, briefing by Stephen Nice, Ph.D.
The Women in the Military Conference
Naval Medical Center Portsmouth, Department of Psychology
"Current Research on Military Women's Health Care Initiatives"

03 November 1995, London, United Kingdom, briefing by Stephen Nice, Ph.D.
NATO DRG Panel 8 Workshop
"Current Research on Military Women's Health Care Initiatives"

WOMEN ABOARD NAVY SHIPS WORKSHOP

March 1 & 2 1995
San Diego, CA

Ron Clapsaddle, Senior Computer Programmer/Analyst
Ogden Government Services
Terry Conway, Ph.D., Research Director
Center for Behavioral and Community Health, San Diego State University
Kristee Emens-Hesslink, M.A., Psychologist
GEO-Centers, Inc.
Mike Feris, East Coast Coordinator
Management Assistance and Concepts Corporation
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Navy Personnel Research and Development Center
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Navy Personnel Research and Development Center
Ross Vickers, Ph.D., Research Psychologist
Naval Health Research Center
Debbie Wingard, Ph.D., Associate Professor
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WOMEN ABOARD NAVY SHIPS WORKSHOP

May 8 & 9 1995
San Diego, CA

Ralph Burr, M.A., Statistician
Naval Health Research Center
Ron Clapsaddle, Senior Computer Programmer/Analyst
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APPENDIX B

Report Topics and Analysis Plans

APPENDIX B

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B.1 **REPORT TOPIC AREA**: **Gender Differences in Health Conditions Among Navy Personnel**

PROPOSED LEAD AUTHORS: Deborah Wingard, Ph.D. and Donna Kritz-Silverstein, Ph.D.

ABSTRACT:

Using shipboard questionnaire data and other resources, this report will investigate the prevalence of health conditions and symptoms in young women and men of several ethnic/racial groups aboard Navy ships. It will also examine gender differences in the reporting of specific health conditions and symptoms, as well as in the total number of conditions reported by men and women. Specifically, gender differences in the experience of migraines and other headaches and gender differences in injury rates within specific ratings will be examined. Comparisons will be made between deployed and non-deployed individuals to determine if deployment has a negative association with health.

HYPOTHESIS:

It is expected that within each gender, the prevalence of symptoms will increase with increasing age and be higher among ethnic/racial minorities. It is also expected that women will report a greater prevalence of headaches, injuries, and other symptoms and conditions than men and that those who are deployed will report a higher prevalence of symptoms and conditions than the non-deployed. Because individuals who have a lower pay grade and rating may have jobs with less control, and to the extent that having less control is more stressful, it is also expected that there will be an inverse association between pay grade and rating and the prevalence of symptoms and conditions.

ANALYSIS PLANS:

Variables:

Independent Variables and Co-Variates:

Gender, age, race/ethnicity, deployment status, pay grade and rating.

Dependent Variables (in separate analyses):

The experience in the past 30 days of any of the following health conditions or symptoms: headache (migraine, non-migraine); injuries (muscle sprain or strain, back problems, other); common cold symptoms; dizziness; chills; cough; sore throat; fever; flu; diarrhea lasting at least 3 days; stomach problems; constipation; indigestion; nausea/vomiting; sinus trouble; hay fever; shortness of breath; hoarseness; skin problems; hearing problems; irritated eyes; trouble seeing

with one or both eyes even if wearing glasses or contacts; pain in stomach; heat stress or heat stroke; and psychological conditions or personal problems severe enough to interfere with daily activities. Other dependent variables are a physician's diagnosis in the past 30 days of: cold or acute nasopharyngitis; sore throat, viral; cough, viral; and flu. The Navy questionnaire includes the major components of the International Headache Society diagnostic criteria for migraines (visual disturbances, numbness or tingling, sensitivity to noise and sensitivity to light), as well as prior physician diagnosis of migraine.

Statistical Analyses:

Sex-specific frequencies will be computed for each of the dependent variables to yield the overall prevalence of each health related condition and symptom. Stratification within each gender by age (less than 20, 20-24, 25-39, 30-34, 35-39, and 40 and older) and comparisons with chi square analyses and the Mantel-Haenszel extension test will be used to examine the age- and sex-specific prevalence rates. Prevalence rates after stratification by race/ethnicity, deployment status, pay grade, and rating will also be examined. Gender differences in the prevalence of each health condition and symptom will be examined with logistic regression to adjust for age, race-ethnicity, and other factors such as deployment status.

Secondary Analyses:

Secondary analyses will focus on the associations of lifestyle variables, such as cigarette smoking, alcohol consumption, exercise, sleep, depression, and stress, with the prevalence of specific health conditions and symptoms (questionnaire items 27-32, 35-37, 42-45, 47-48, 50). We expect that cigarette smoking, alcohol consumption, lower exercise, fewer hours of sleep, and higher rates of depression or stress will be associated with a higher prevalence of health conditions and symptoms. These analyses will be performed separately within men and women. Age-adjusted comparisons of the prevalence of each condition and symptom by lifestyle category will be performed with the Mantel-Haenszel extension test and/or logistic regression. Separate comparisons will also be adjusted for and/or stratified by race/ethnicity, deployment status, pay grade, and rating. Similarly, for each sex, scores on the measures of depression and stress will be calculated, and age-adjusted comparisons of the prevalence of each condition and symptom by quartile of depression or stress score will be performed with the Mantel-Haenszel extension test. Logistic regression will be used to examine the association of depression or stress scale score with each of the symptoms and conditions after adjustment for age. Separate comparisons will also be adjusted and/or stratified by race/ethnicity, deployment status, pay grade, and rating.

Several studies have noted that women report more migraine headaches than men (15-18 percent compared to approximately 6 percent) and that migraines occur most frequently between the ages of 25 and 55 years (Lipton, R.B., Stewart, W.F., 1994; Migraine prevalence, Neurology, 1994). One population-based study in Finland reported that among women 54 percent of all headaches were migraines, compared to 39 percent among men (Honkasalo, M.L., Kaprio, J., Heikkila, K., Silanpaa, M., Koskenvuo, M., 1993). In the United States, women from lower-

income households were at higher risk of having migraines and were more likely to use health care services for their headaches even after adjusting for headache severity (Celentano, D.D., Linet, M.S., Steward, W.F., 1990; Stewart, W.F., Lipton, R.B., Celentano, D.D., Reed, M.L., 1992). In the present study, the age-adjusted prevalence of migraine and non-migraine headaches will be examined separately for men and women using the Mantel Haenszel extension test and/or logistic regression. Analyses will be adjusted for possible confounders, such as cigarette smoking, alcohol consumption, lower exercise, fewer hours of sleep, and higher rates of depression or stress. We will examine the influence of exogenous estrogen use on headaches occurrence. Separate comparisons will be adjusted and/ or stratified by race/ethnicity, deployment status, pay grade, and rating.

In several national samples, more men than women have reported injuries (National Center for Health Statistics, 1994; Cherpitel, C.J., 1993). However, among intercollegiate athletes (Lanese, R.R., Strauss, R.H., Leizman, D.J., Rotondi, A.M., 1990) and military trainees (Jones, B.H., Bovee, M.W., Harris, J.M.3rd, Cowan, D.N., 1993; Ross, J., Woodward, A., 1994), women experience equal numbers or more injuries than men. This may reflect women's greater risk of injury given equal exposure activity. Physiologically, women have less muscle strength, lower bone mass, less lean muscle mass, more body fat, and a gynoidal fat distribution (Sanborn, C.F., Jankowski, C.M., 1994). Some of these characteristics may make women more prone to injury, given a similar impact or fall. In the present study, the age-adjusted prevalence of injuries in the past 30 days (including muscle sprain or strain, back problems, and other injuries) will be examined separately for men and women using the Mantel-Haenszel extension test and/or logistic regression. Analyses will be adjusted for possible confounders, such as race/ethnicity, obesity (weight in kilograms/height in meters^2), alcohol consumption, lower exercise, fewer hours of sleep, higher rates of depression or stress, recent lifting of 25-49 or 50 or more pounds, and use of protective gloves or boots. Separate comparisons will also be adjusted and/or stratified by deployment status, pay grade and rating. These occupational classifications reflect different exposures to work related injury. Questionnaire data on injuries will be supplemented with injury data from sick logs aboard ship for separate analyses.

LITERATURE REVIEW:

There are numerous reports indicating that women use medical care and seek help from health care providers more often than men (Corney, R.H., 1990; Kendrack, M.A., Grant, K.R., Segall, A., 1991; Wingard, D.L., 1984; Celentano, D.D., Linet, M.S., Stewart, W.F., 1990). Women have also been found to report more symptomatology and higher morbidity than men (Wingard, D.L., 1948; Celentano, D.D., Linet, M.S., Stewart, W.F., 1990; Gijsbergs van Wijk, C.M., Van Vliet, K.P., Kolk, A.M., Everaerd, W.T., 1991; Klonoff, E.A., Landrine, H., 1992; Harris, R.B., Weissfeld, L.A., 1991; Wool, C.A., Barsky, A.J., 1994). For example, 15-18 percent of women report migraine headaches compared to approximately 6 percent of men (Lipton, R.B., Stewart, W.F., 1994; Migraine prevalence, Neurology 1994). However, there are relatively few large, population-based comparisons of the experience of symptoms and health

conditions of relatively young men and women. There are also very few studies with sample sizes large enough to describe gender differences within different racial/ethnic groups. Data from the National Health Interview Survey suggests there may be substantial variations (Wingard, D.L., Patterns and Puzzles: the distribution of health and illness among women in the U.S.)

One possible exception to the female excess of morbidity is that more men than women have reported injuries in several national samples (National Center for Health Statistics, 1994; Cherpitel, C.I., 1993). However, among intercollegiate athletes the only gender difference in injuries was a female excess among gymnasts (Lanese, R.R., Strauss, R.H., Leizman, D.J., Rotondi, A.M., 1990), while two studies of military trainees have reported a female excess of injuries (Jones, B.H., Bovee, M.W., Harris, J.M.3d, Cowan, D.N., 1993; Ross, J., Woodward, A., 1994). Thus, it appears that given equal exposure to risk (either sports or occupational), women may experience more injuries than men.

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B.2 **REPORT TOPIC AREA**: **Health Beliefs Model in Shipboard U.S. Navy Men and Women**

PROPOSED LEAD AUTHOR: LT Michael James Schwerin, MSC, USNR

ABSTRACT:

This report will examine the health behavior of male and female U.S. Navy personnel aboard ships in relation to the Health Beliefs Model (Becker, 1974). The report attempts to explain health-seeking behavior by analyzing its relationship to antecedent conditions within the individual. Initially, willingness to seek health care for an illness is influenced by individual's perception of susceptibility to and severity of the illness. Health seeking action can be triggered by an individual's evaluation of health status. This evaluation reflects perceived susceptibility to and severity of a particular disease. Health-seeking behavior depends upon an individual's estimate of the potential benefits of the behavior in reducing susceptibility or severity. The estimated benefits are then weighed against perceptions of physical, psychological, financial, and other risks; costs; and barriers.

HYPOTHESIS:

This report will examine the perceptions of: susceptibility to disease, potential severity of disease, benefits of health-seeking, and barriers in the health-finding effort among male and female shipboard personnel in the U.S. Navy. Furthermore, the report will identify factors which effect individuals' perceptions of their health-seeking behavior (self-report of pathology) and factors which effect that person's actual health-care utilization (actual reasons for sick call visit).

The report will also address which HBM factors (perceived susceptibility to disease, perceived severity of disease, potential benefits and perceptions of barriers) may influence the gender differences that exist in health care utilization aboard ship. The report will also examine the HBM factors in traditional/non-traditional occupational roles, as initially examined by Nice and Hilton (1992).

ANALYSIS PLANS:

An identification of health care utilization barriers will also be sought. With additional information as to the perceived physical, psychological, and various other barriers to health care, both patient and health care providers will benefit.

Variables:

The Health Belief Questionnaire (HBQ; Norman & Fitter, 1995; Norman and Fitter, 1989) is based on the HBM (See Appendix 1). Items were selected for the HBQ from items in previous studies measuring the HBM (Berkanovic et al., 1981; Canlan, 1984; Champion, 1984; Cummings

et al., 1978; Elder et al., 1985; Jette et al., 1981; King, 1982; Mainman et al., 1977; Norman & Fitter, 1989; Pill et al., 1988; Schwoon & School, 1979; Weissfeld et al., 1987). Cronbach alpha for each subscale appear in Table 1.

Table 1. Cronbach alpha for Health Belief Model Questionnaire subscales

Subscale Name	A	B	C	D
Health Value	.54	.69	.77	.80
Health Comparison	.70	.75	---	---
Illness Activities	.56	.64	---	---
Susceptibility to Serious Illnesses	.89	.94	.91	.86*
Susceptibility to Health Problems	.54	.53	---	.90*
Severity of Serious Illnesses	.95	.95	.97	.86*
Severity of Health Problems	.58	.82	---	.90*
Barrier: Motivation	.84	.72	.75	.92
Barrier: Worries	.72	.71	.66	.76
Barrier: Reasons	.58	.76	---	.79
Barrier: Time Constraints	---	.90	.58	---

A Norman & Fitter (1989)
B Norman & Fitter (1991)
C Norman (1993)
D Norman & Conner (1993)
* Serious and Health Problems were combined into one scale.

The five scales of the HBQ include General Health Beliefs, Perceived Susceptibility, Perceived Severity, Perceived Benefits, and Perceived Barriers.

For the first scale, General Health Beliefs, three subscales were constructed. The first subscale measures health value ("How important do you think it is that people take special care of their health?"); the second subscale measures health comparison ("Compared to other people of your age, would you say you get ill much more/less often?"); and the third general health beliefs subscale measures illness activities ("When I'm ill, I try to keep going on as usual."). These subscales are essential in determining whether men and women place differential values on healthcare in general, regardless of available healthcare facilities.

The next series of scales directly measures the HBM. Perceived Susceptibility asks the individual's perceived vulnerability the Health problems (weight problems, high blood pressure) and Serious conditions (cancer, heart disease, stroke, heart attack).

Perceived Severity measures the respondent's concern of Health problems (weight problems, high blood pressure) and Serious conditions (cancer, heart disease, stroke, heart attack).

Perceived Benefits is measured by a single item, "How effective do you think health screening is in reducing your chances of getting a serious illness?". Cronbach alpha was not calculated for this single item.

Finally, Perceived Barriers is measured by four subscales: Time constraints ("I would have problems getting an appointment."); Motivation ("I'm too lazy."); Reasons ("I'm already seeing the doctor a lot."); and Worries ("Fear of the results of screening—of what they might find.").

The dependent measure for intent to utilize healthcare or not utilize healthcare could be measured by the item, "If you had the opportunity, how likely is it that you would use sick call?" Subjects would respond from 1–4 (very unlikely, unlikely, likely, very likely). The dependent measure of healthcare attendance could be measured as a dichotomous variable (1=yes; 2=no).

Statistics:

Differentiation between groups of people (high intent/low intent; utilize/do not utilize) will be necessary. Discriminant analysis appears to be an effective statistical tool in differentiating between two groups. Variables included in analysis will include subscales from the HBM (Health Value, Health Comparison, Illness Activities, Perceived Susceptibility of Health Problems, Perceived Susceptibility of Serious Conditions, Perceived Severity of Health Problems, Perceived Severity of Serious Conditions, Perceived Benefits, and Perceived Barriers: Time Constraints, Motivation, Reasons, and Worries).

Appendix 1

Health Beliefs Model Questionnaire Items and Constructs

Health Beliefs Model Questionnaire (Norman & Fitter, 1989; Norman & Fitter, 1991). All items are answered on a scale of 1-4, from very extremely negative, negative, positive, very positive (e.g., "1=not at all often; 2=not often; 3=often; 4=very often."

General Health Beliefs.

Health Value

1. How often do you think about your health?
2. How concerned are you about your health?
3. How important do you think it is that people take special care of their health?
4. How likely is it that you will try to do a better job of taking care of your health in the future?

Health Comparison

5. Compared to other people of your age, would you say you get ill much more/less (neg keyed) often?
6. Compared to other people of your age, when you do get ill would you say you get much more/less (neg keyed) often?
7. I seem to resist illness better than other people.

Illness Activities

8. In general, when you get ill, how much does it interfere with your usual activities?
9. When I'm ill, I try to keep going on as usual.
10. When I'm ill, I cut back on whatever I'm doing in order to get well.

Perceived Susceptibility. How likely do you feel it is that you will develop any of the following problems in the next 12 months?

Health Problems

11. Weight problems
12. High blood pressure

Serious Conditions

13. Cancer
14. Heart disease
15. Stroke
16. Heart attack

Perceived Severity. How serious a health problem do you think the following would be if you were to develop them?

Health Problems

17. Weight problems
18. High blood pressure

Serious Conditions

19. Cancer
20. Heart disease
21. Stroke
22. Heart attack

Perceived Benefits.

23. How effective do you think health screening is in reducing your chances of getting a serious illness?

Perceived Barriers. Which of the following reasons would stop you from attending a screening appointment?

Time Constraints

24. It would take up a lot of my spare time.
25. I would have problems getting to an appointment.
26. It would be too much effort.
27. I have other more important things to do.

Motivation

28. I'm uninterested.
29. I'm too lazy.

Reasons

30. I might be "told off."
31. I already feel healthy.
32. I don't know enough about it.
33. I'm already seeing the doctor a lot.

Worries

34. Fear of the results of screening—of what they might find.
35. It would be embarrassing.
36. Would you be worried about any aspects of a screening appointment?

Appendix 2

Health Beliefs Model Questionnaire

53a. Please use the following scale for the first 10 items below: 1=Not at all; 2=Somewhat; 3=Frequently; 4=Very much so.

1.	How often do you think about your health?	1 2 3 4
2.	How concerned are you about your health?	1 2 3 4
3.	How important do you think it is that people take special care of their health?	1 2 3 4
4.	How likely is it that you will try to do a better job of taking care of your health in the future?	1 2 3 4
5.	Compared to other people of your age, would you say you get ill much more often?	1 2 3 4
6.	Compared to other people of your age, when you do get ill would you say you get ill much more often?	1 2 3 4
7.	I seem to resist illness better than other people.	1 2 3 4
8.	In general, when you get ill, how much does it interfere with your usual activities?	1 2 3 4
9.	When I'm ill I try to keep going on as usual.	1 2 3 4
10.	When I'm ill I cut back on whatever I'm doing in order to get well.	1 2 3 4

53b. How likely do you feel it is that you will develop any of the following problems in the next 12 months? Please use the following scale to answer the next six questions: 1=Very unlikely; 2=Unlikely; 3=Likely; 4=Very likely.

11.	Weight problems	1 2 3 4
12.	High blood pressure	1 2 3 4
13.	Cancer	1 2 3 4
14.	Heart disease	1 2 3 4
15.	Stroke	1 2 3 4
16.	Heart attack	1 2 3 4

53c. How serious a health problem do you think the following would be if you were to develop them? Please use the following scale to answer the next six questions: 1=Not at all severe; 2=Not severe; 3=Severe; 4=Very severe.

17.	Weight problems	1 2 3 4
18.	High blood pressure	1 2 3 4
19.	Cancer	1 2 3 4
20.	Heart disease	1 2 3 4

21.	Stroke	1 2 3 4
22.	Heart attack	1 2 3 4

53d. Use the following scale to answer the next question: 1=Not at all effective; 2=not effective; 3=Effective; 4=Very effective.

23.	How effective do you think health screening is in reducing your chances of getting a serious illness?	1 2 3 4

53e. Which of the following reasons would stop you from going to sick call? 1=Very untrue; 2=Untrue; 3=True; 4=Very true.

24.	It would take up a lot of my spare time.	1 2 3 4
25.	I would have problems getting to an appointment.	1 2 3 4
26.	It would be too much effort.	1 2 3 4
27.	I have other more important things to do.	1 2 3 4
28.	I'm uninterested.	1 2 3 4
29.	I'm too lazy.	1 2 3 4
30.	I might be 'told off.'	1 2 3 4
31.	I already feel healthy.	1 2 3 4
32.	I don't know enough about it.	1 2 3 4
33.	I'm already seeing the doctor a lot.	1 2 3 4
34.	Fear of the results of screening — of what they might find.	1 2 3 4
35.	It would be embarrassing.	1 2 3 4
36.	Would you be worried about any aspects of a screening appt.?	1 2 3 4

LITERATURE REVIEW:

The Health Beliefs Model:

The Health Beliefs Model (HBM) was conceptualized as a framework for understanding why individuals did or did not engage in a wide variety of health-related actions (Janz & Becker, 1984). Since the 1950's, the HBM has been utilized in immunization programs (Rosenstock, 1974), preventive breast self-examination (Hallas, 1982; Calnan & Moss; 1984), adherence to therapeutic regimens (Becker, Drachman & Kirscht, 1972; Cummings, Becker, Kirscht, et al., 1982; Gordis, Markowitz & Lilienfeld, 1969; Harris, Skyler, Linn, et al., 1980; Inui, Yourtee & Williamson, 1976; Kirscht & Rosenstock, 1977; Taylor, 1979), preventive health behavior (Langlie, 1977), smoking (Weinberger, Greene, Mamlin, et al., 1981), and dietary compliance (Becker, Maiman, Kirscht, Haefner & Drachman, 1977). In a review of the results of 29 HBM-related investigations, Janz and Becker (1984) conclude that there is "substantial empirical support for the HBM" (p. 1). Additionally, Winett (1995) identifies the HBM as an effective means of enhancing health promotion. He states that the HBM, as well as the theory of reasoned action (Ajzen & Fishbein, 1984) and protection motivation theory (Rogers, 1984) "all strive to present salient information to specific individuals to increase a sense of vulnerability, convey the notions of normative changes favorable to adopting the product, and emphasize the benefits to costs of adoption (i.e., increase outcome expectancy)" (p. 347).

Health Beliefs Model and Utilization of Health Care:

Utilization of health care and the role of the HBM has been researched on several occasions in the past five years. Norman and Fitter (1989) examined the role of the HBM in attending health screenings. This study employed a new HBM questionnaire and the Health Locus of Control questionnaire. Correlational and regression analyses show general health beliefs to be poor predictors of intent to attend screenings while significant predictors include perceptions of the efficacy of screenings, perceptions of barriers (worries of the screening appointment), and perceived susceptibility to common illness. Of the demographic variables included in analyses (age, sex, marital status, and education level), only marital status was a significant predictor of intent to utilize health screening ($r=-0.11$, $p<.05$).

Norman and Fitter (1991) then sought to identify variables that would be predictive of health screening attendance. An HBM questionnaire similar to that of the previous study was used. A stepwise discriminate analysis showed that patients' beliefs about the severity of high blood pressure and weight problems, worries about the screening appointment, and the extent to which patients reported cutting back on everyday activities when ill discriminated between screening attenders and non-attenders.

Norman (1993) examined the HBM and intent to attend a health check. The HBM questionnaire used in previous studies (Norman and Fitter, 1989; 1991) was used in this study. Significant correlates of health check intent to attend included health value, efficacy of doctors,

benefits, motivational barriers, time barriers, and worries. Significant correlates of intent were introduced into a stepwise regression formula to identify predictors of attendance. Significant predictors included benefits of health checks, motivational barriers, and time barriers. These three variables accounted for 59 percent of the variance associated with intent.

Significant correlates of attendance included health value and intent. As with intent, significant correlates were entered into a stepwise regression formula to determine significant predictors of attendance. Health value was the only significant predictor of attendance, accounting for four percent of the variance.

Norman and Conner (1993) used the HBM questionnaire as well as the Theory of Planned Behavior (TPB: Ajzen, 1988; 1991) to predict attendance at health checks. HBM factors which showed between group differences (attenders and non-attenders) included health value, benefits, and efficacy of health checks. HBM factors which were significantly predictive of attendance, as shown by a discriminant analysis, included health value, benefits of health checks, and motivational factors.

Gender Differences in Health Care Utilization:

Gender differences in health care utilization have been shown to exist in both civilian and military populations. In a civilian population controlling for pregnancy health care utilization and age, numerous studies have demonstrated that women utilize health care more than men (Andersen & Anderson, 1967; Briscoe, 1987; Cleary, Mechanic & Greenley, 1982; Hankin, 1974; Kohn & white, 1976; Nathanson, 1975; Tessler, Mechanic & Dimond, 1976; Verbrugge, 1979; Verbrugge, 1985; Verbrugge & Depner, 1980). In an examination of U.S. Navy shipboard personnel and their utilization of health care, Nice and Hilton (1992) found that shipboard women utilize health care more than men and that women in non-traditional occupations visited sick call significantly more than women in traditional occupations. It seems apparent that gender differences in health care utilization exist in civilian and military populations.

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B.3 **REPORT TOPIC AREA: A Comparison of Men and Women Aboard Navy Ships: Life Stress Conditions, Psychosocial Stress, Distress, Coping and Quality of Life Issues**

PROPOSED LEAD AUTHOR: James A. Martin, Ph.D., BCD

ABSTRACT:

This report will explore three broad domains of psychosocial research: sources of current psychosocial stress, perceived impact of stressors, and the impact of distress on the performance of military duties and personal life responsibilities. The primary focus will be psychosocial stressors in the work environment aboard ship and the perceived impact of these stressors on current levels of psychosocial distress. Other military and personal life stressors also will be examined as part of assessment of the overall quality of life of women aboard ship. The report also will examine the impact of distress as it relates to perceived performance of military duties and personal life responsibilities, as well as the impact of distress on objective measures of health, well-being, job performance, and personal life role performance.

HYPOTHESIS: (A representative and not an exhaustive list):

Primary Focus (includes both a duty and personal life focus):

Determine current sources of psychosocial stress.

Determine current level of psychosocial distress.

Determine the impact of distress on duty performance.

Determine the impact of distress on health and well-being.

Determine factors associated with stress mediation.

Determine factors associated with enhanced coping.

Hypotheses and Expected Findings: (A representative and not an exhaustive list):

Women will report more stress related to onboard ship duty issues and living conditions/relationships.

Women will experience more distress related to onboard ship duty and living conditions/relationships.

Stress issues related to non-duty personal life and background issues will be different for women and will present an added stressor.

Women's self-assessed and objective performance of duty will not differ from men.

Women will present a less favorable self-assessment of personal/family life performance and will report a more negative overall assessment of physical, psychological, and behavioral well-being.

ANALYSIS PLANS:

Variables of Interest: (A representative and not an exhaustive list):

Independent: Life stress variables.

Dependent: Psychological distress measure (CES-D short form) and self-assessed job performance and personal life measures, health symptoms and health care utilization, objective health indicators, objective duty status indicators.

Co-Variables/Control Variables: Demographic characteristic, including age, race, education, marital status, number of children, ship type, ship living conditions and deployment status, peer and leader relationship variables.

Other sources of data that will be used to support this effort:

The Navy's 1995 POWR Assessment: Perceptions of Wellness and Readiness (POWR) data will be used for comparison purposes, to include validation of the CES-D short form versus the full CES-D and the Hopkins Symptom Checklist as a useful measure of distress for Navy women. Data from the Navy's 1995 Antarctic Health Survey will also be used to validate the usefulness of the stress, distress, and performance variables used in the current U.S. Navy Shipboard Health Survey. Data will also be used from associated medical and personnel status records. A major by-product of this effort will be the intended confirmation of the CES-D short form as a reliable, valid, and useful brief measure of psychosocial distress for future Navy health studies. Currently, there are no psychosocial distress scales that have been validated with military women.

Statistics:

Data analysis will make use of a full range of descriptive statistics. Multivariate analyses using a variety of reliability, factor analytic, and multiple regression methods will be used to establish the appropriateness (reliability, validity, and predictive utility) of the survey's individual items, measures, and scales, and to determine patterns of relationships among and between the variables of interest. All data will be analyzed using SPSS generated statistical programs.

LITERATURE REVIEW:

This research is grounded in the extensive "stress and well-being" literature that has evolved in the health and social science disciplines of psychology, psychiatry, sociology, social work, nursing, and epidemiology (Cohen, Kessler, and Gordon, 1995).

The focus on stress, stress response, and physical, psychological, and behavioral outcomes derives from the work of Mason (1975), builds on the concepts of life stress events (Dohrenwend, Raphael, Schwartz, Stueve, and Skodol, 1993) and stressful life conditions (Wheaton, 1990), and the potential cumulative effects of daily stressors on physical, psychological, and behavioral health and well-being (Bolger, DeLongis, Kessler, Reed, and Neal, 1987). The concept of well-being is rooted in the work of Campbell (1976) and maintains its usefulness as demonstrated by the recent interest of the Secretary of Defense to enhance the quality of life for members of the military services and their families.

The model for understanding the stress process derives primarily from the work of Lazarus (Lazarus and Folkman, 1984) and includes both an understanding of the stress appraisal process, the concept of coping (Lazarus, 1981), and the full range of human responses that may be elicited by the stress-coping process (Cohen, Evans, Krantz, and Stokols, 1986).

This research builds on a long history of military-specific stress and well-being research conducted at the Army Research Institute for the Social and Behavioral Sciences (ARI), the Walter Reed Army Institute of Research (WRAIR), and the Naval Health Research Center (NHRC). It also directly builds on the research efforts underway as part of the 1994 Defense Women's Health Research Program. In this regard, Dr. Martin has collaborated extensively with Navy scientists in the design phase of the current U.S. Navy Shipboard Health Survey. In addition, he is collaborating with Dr. Jessica Wolfe, Director of the Veterans Administration Women's Health Research Center, on a longitudinal study of health and well-being issues related to women's service in the Gulf War. Dr. Martin is a Guest Scientist at the Department of Military Psychiatry, Walter Reed Army Institute of Research, and is involved in the analysis of related military duty and military life stress data from WRAIR's multi-faced Gulf War studies. Prior to his retirement from active duty, Colonel Martin was a principal investigator in this WRAIR scientific program.

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B.4 **REPORT TOPIC AREA**: **Exploration of Stress Differences by Gender Aboard U.S. Navy Ships**

PROPOSED LEAD AUTHOR: Ross R. Vickers, Jr., Ph.D. and James A. Martin, Ph.D., BCD

ABSTRACT:

The objective of this report will be to determine whether there are gender differences in the organization and meaning of common experiences. The report will analyze the associations of gender, marital status, and family composition with variables including stress, job and life satisfaction, health status, and health utilization. The report will explore whether traditional foci may be insensitive to the fact that the same event or circumstance may mean different things to different people.

Group comparisons in behavioral sciences typically focus on differences in mean levels of psychological variables. In the case of gender differences, women and men might be compared with respect to their average levels of stress, distress, illness, or job satisfaction. This focus may be insensitive to the fact that the same event or circumstance may mean different things to different people. The objective of this is to determine whether there are gender differences in the organization and meaning of common experiences.

HYPOTHESIS:

Stress will be less differentiated for married women than for single women or men. Women traditionally have been expected to be the primary care givers within families. Married women, therefore, can be expected to encounter more role conflict when job demands are acute. Males and single women are more likely to be able to focus on the job without concomitant effects on homelife stress. This hypothesis implies the presence of beta differences between married females and other sailors with respect to the structure of stress.

Stress will have a stronger relationship to distress in married women than it does among single women or men. This hypothesis assumes that stressors have synergistic effects. A stress that would have limited effects if it were the only problem a person faced at a given time may have much stronger effects when it occurs in combination with other stressors. This hypothesis implies the presence of gamma differences between married women and other sailors.

The preceding hypotheses focus on the potential effects of role conflicts for married women assigned to shipboard duty. The hypotheses actually apply to both men and women who occupy the roles of breadwinner and care giver, but it is expected that the number of men who are single parents, for example, will be too small to permit effect tests of hypotheses. In addition, the hypotheses can be extended to other individuals who are in situations which increase the

probability of role conflict (e.g., dual career families). These possibilities will be explored, but the hypotheses were stated in terms of what may be the most extreme contrasts available.

ANALYSIS PLANS:

The sample providing the data is described elsewhere in this proposal. The social classification of individuals will be determined from self-reports of gender, marital status, and family structure. Stress indicators will be 30 items in the U.S. Navy Shipboard Health Survey dealing with working conditions, living conditions, and interpersonal/ family stressors.

Potential effects of stress which will be examined to determine gamma differences between groups include self-reports of emotional distress measured by a brief form of the Center for Epidemiologic Studies Depression scale (Radloff, 1977), quality of life, job and life satisfaction, coping, and health status. Objective measures of health care utilization also will be employed.

Structural equation modeling will provide the basic tests of hypotheses. LISREL VII will be applied in a multiple group analysis which will include modeling of mean values (Joreskog & Sorbom, 1989). Modeling will follow the two-stage procedure recommended by Marsh, Balla, and MacDonald. The first stage will develop and compare measurement models across the different groups in the analyses. Initial models will restrict measurement parameters to be equal. Alpha differences will be modeled by permitting the means to differ between groups. Beta change will be modeled by permitting factor loadings to differ between groups. The second stage of the analysis will relate the stress measures to the dependent variables. Gamma change will be tested by first restricting associations to be equal, then permitting them to vary across groups. The order of releasing constraints on the group parameters will be determined by the hypotheses as far as possible. Alternative models will be compared based on goodness-of-fit indices adjusted for parsimony (Mulaik, James, Van Alstine, Bennett, Lind & Stilwell, 1989).

LITERATURE REVIEW:

The conceptual approach applies Golembiewski's (Golembiewski, Billingsley & Yeager, 1976) conceptual model of alpha, beta, and gamma change (ABG change) to differences in male and female perceptions of stress. The ABG change model distinguishes between changes that alter the mean level of a variable (alpha change), changes that alter the coherence of specific behaviors as indicators of differences in the variable (beta change), and changes that alter the relationships between a given variable and other variables (gamma change).

The ABG change model was developed to describe the effects of organizational interventions. However, the concepts logically apply to any set of processes that affect psychosocial development. Thus, if gender essentially assigns a person to different biological and/or social "treatments" at birth, the cumulative impact of that treatment may be manifest in any of the three types of change. All three types of differences must be examined to understand the nature of gender differences. Other efforts within the overall project address alpha gender differences, so the present efforts will focus on beta and gamma differences.

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B.5 **REPORT TOPIC AREA: Comparison of Psychological Symptomatology According to the Brief Symptom Index in Women and Men Aboard Navy Ships, and Comparison With Army Data on Personnel Deployed During Operations Desert Shield and Operation Desert Storm**

PROPOSED LEAD AUTHOR: Kathleen M. Wright, Ph.D.

ABSTRACT:

This report will focus on the analysis of the Brief Symptom Inventory (BSI), and be organized into three interrelated areas, each having specific products: establishing gender-based norms for military service members; collecting prospective longitudinal follow-up data on the effects of shipboard duty and deployment for male and female service members; identifying groups at high- and low-risk for symptoms and relating risk status to other health and performance indicators.

HYPOTHESIS:

The BSI Manual (Derogatis & Spencer, 1982) reports some normative data for patient and non-patient samples. Other than that, there were few normative studies described in the literature prior to the extensive studies undertaken by the Department of Military Psychiatry during the Gulf War. Since that time, norms have been determined for a large sample of primarily male soldiers and may be used in comparison to the Navy sample.

ANALYSIS PLANS:

Establish norms for the sample of Navy males and females matched on demographic variables.

Compare results on the nine symptom dimensions and the global indices of psychological distress for males and females; determine whether there are any differences based on gender or other demographic factors.

Perform factor analysis to validate internal structure of the BSI.

Prospective Data:

Consider these data as the first phase of a large scale prospective study with data collection points during or post future deployments.

Begin to establish a data base that may be followed longitudinally to determine the effects of onboard ship duty and deployment over time.

Determine the impact of prior deployment history on adaptation for male and female personnel.

Identification of Groups at Risk:

The GSI may be used as an overall indicator of psychological distress and, as such, can help identify groups at risk. Corresponding health and performance data can then be related to risk status for males and females.

Determine whether there are gender differences in risk indicators.

Determine whether risk status relates to a history of previous deployments as reported in the Military History of Deployment survey section.

Relate risk status to health symptoms and performance assessment.

Use risk status as pre-notification of future deployment baseline data for longitudinal follow-up of male and female samples.

Normative Data:

Males and females will differ on reported symptoms, overall GSI, and symptom profiles, with females reporting higher levels of psychological distress than males.

Those currently deployed who have a history of previous deployments will report lower levels of psychological distress than those without such history, regardless of gender.

Prospective Data:

Those reporting elevated levels of psychological distress at pre-deployment baseline will have greater difficulty coping when a deployment occurs, demonstrating increased physical symptoms, poorer performance, and greater psychological distress, regardless of gender.

Risk Status:

Those with high risk status as determined by GSI cut-off scores empirically derived from the normative data base will also report elevated physical symptoms and more frequent sick call visits.

Those with the highest risk status (the "outliers") will also report lower performance assessments, poorer coping, and a more difficult adaptation to onboard ship duty than those at lower risk, regardless of gender.

Variables:

Independent: Onboard ship duty and stresses; deployment status.

Dependent/outcome measures: BSI symptom dimensions; Global Severity Index; constructed scales based on results of factor analyses; other health-related indicators.

Co-variables: Demographic factors; history of previous military deployments.

Statistics:

Normative Data:

Factor analysis of the BSI will assess the internal structure of the instrument and verify the hypothesized dimensions. BSI subscales and GSI will be transformed into T-scores for comparison with the norms in the BSI manual and the norms established for the Gulf War samples. Norms will be gender keyed separately for males and females. T-tests will compare mean differences between male and female Naval personnel assessed for the current study and between the Navy samples and samples of Army personnel collected in 1991 and 1992 following the Gulf War.

Multiple regression analysis will test for the effects of previous deployments, mitigating levels of psychological distress during the present deployment, controlling for gender and other demographic variables.

Prospective Data:

Should there be the opportunity for follow up of subsamples of the population, then longitudinal comparisons of groups on the outcome measures may help determine adaptation to onboard ship duty. For example, changes in psychological status assessed by the GSI at Time 1 and Time 2 (ideally at the beginning and end of a deployment) can be correlated with physical symptoms and performance measures for males and females to compare adjustment rates.

Risk Status:

The male and female samples will be divided into high and low risk status based on GSI scores. Risk status will be correlated with sick call visits and health indicators documented over the course of the deployment. Risk status will also be related to history of previous deployments.

LITERATURE REVIEW:

Brief Symptom Inventory:

The Brief Symptom Inventory (BSI) is a 53-item self-report scale of symptoms (Derogatis & Spencer, 1982) derived from the 90-item Symptom Check List (SCL-90-R, Derogatis, 1977). Respondents are requested to rate the items on a 5-point scale of distress, ranging from "none" (0) to "extreme" (4), using the past week as a time frame for assessment. The BSI has been used extensively in both research and clinical practice to determine symptom profiles for psychiatric and medical patients and non-patient populations (Del-Vecchio-Good, Good, & Cleary, 1987; Francis, Rajan, & Turner, 1990; Marziali, 1984; Norbeck, 1985; Royse & Drude, 1984; Sable, 1989; Stefanek, Derogatis, & Shaw, 1987; Wood, 1982, 1986). Derogatis and Melisaratos (1983) in their frequently cited introductory report include an overview of studies using the BSI analyses, demonstrating high reliability with the SCL-90 ranging from 0.92 to 0.99, indicating that both inventories measure the same constructs and convergent validity between the symptom dimensions of the BSI and the clinical scales of the MMPI. The report also includes normative data for psychiatric inpatient, outpatient, and non-patient populations.

The BSI includes nine symptom dimensions or subscales: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation or Psychoticism, as well as three global indices of psychological distress. Those using the BSI as an outcome measure can assess respondents using either symptom profiles based on subscale scores, or the global indices to determine overall distress level. Internal consistency for all nine symptom dimensions is acceptable, with alpha coefficients ranging from a low of 0.71 on the Psychoticism dimension to a high of 0.85 on Depression. Test-retest reliability of a two week period ranged from a low of 0.68 for Somatization to a high of 0.91 for Phobic Anxiety. The Global Severity Index (GSI) reveals a stability coefficient of 0.90, giving strong evidence for the consistency of the BSI across time (Derogatis & Spencer, 1992).

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B.6 **REPORT TOPIC AREA: Family Composition: Correlates With Quality of Life, Health, Stress, and Coping of Women Aboard Ships**

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ABSTRACT:

Using questionnaire data primarily from items on family composition, service history, and health status, this report will investigate three general hypotheses: health issues for service personnel differ by marital status, family composition, and gender. In addition, length of service, number of deployments, and type of shipboard assignment are related to health issues for service personnel; and health and well being of service personnel aboard ship are influenced by the extent of and involvement with support resources (family, friends, and organizations).

Two recent events have led to the importance of this current research: Congress has mandated the Department of Defense facilitate research on women's health issues, and servicewomen are being assigned to ships that are deploying for a variety of reasons. Health status of women in the civilian population has been found to be related to family composition and social supports (Higgins, C., Duxbury, L., Lee , C. 1994; Cohen, S., Hoberma, H.M., 1983). Therefore, this research investigated the relationship of family factors (marital status and number of children), social supports, and the health status of servicewomen aboard ship.

HYPOTHESIS:

Health issues for service personnel differ by marital status, family composition, and gender. The health status of service personnel will range from excellent to poor. For example, servicewomen with young children will be less healthy than other groups.

Comparisons of servicewomen's and servicemen's (who are serving aboard ship) current mental and physical health will be made by marital status and family composition. Health care utilization records of women and men will also be reviewed to determine frequency of, reason(s) for, access to and where was, care obtained during their stay aboard ship. Self-reports of service personnel's quality of life, stress, and depression will be analyzed to determine their satisfaction with their lives, the amount and extent of stress, and the extent of depression among servicewomen, by marital status and family composition.

Length of service, number of deployments, and type of shipboard assignments will be related to health issues for service personnel regardless of marital status, family composition, and gender. However, these factors are believed to have an additional effect and will be evaluated. As the period of time in Service and numbers of deployments increase, Service personnel will display increasingly better health. Shipboard assignments away from home port will have a

negative effect on the service member's health. His/her health will suffer more and more as time away from home port increases.

Self-reports of service member's health conditions, medical visits, stress, depression, and quality of life will be examined by length of service, number of deployments, and type of shipboard assignment. Additionally, the shipboard health care utilization records will be analyzed by length of service, number of deployments, and type of shipboard assignment. Included in the regression analysis will be gender, marital status, and family composition.

The health and well-being of Service personnel aboard ship will be influenced by the extent of and involvement with their support resources (family, friends, organizations). As the extent of and relationship with family, friends, and organizations increases, the health and well-being of Service personnel will become better. It is expected that servicewomen will report greater number of associations and more active participation with support resources than servicemen. Women with children are also expected to report more associations and active participation with support resources than women without children.

Servicewomen and servicemen aboard ships will provide their perception of their relationships with family, friends, and organizations. This data will be examined to determine differences by gender, health status, marital status, and family composition.

ANALYSIS PLANS:

Variables:

The independent variables are family composition and marital status. The dependent variables are health conditions, medical care information, and mental health status. The co-variables consist of three types: demographic (age, gender, education, and race of service member), military information (length of military service, assignment to ship, status of ship, length of current ship assignment, number of deployments), and social support resources (relationships with family, friends and peers, associations with organizations, and perceptions of the helpfulness of Navy professionals and personnel).

Analyses:

Descriptive data using frequencies, percentages, measures of central tendency and variability will be calculated for all the variables listed above: independent, dependent, and co-variables. The predictive information will be obtained using correlations, analysis of variance, and multiple regressions.

Theoretical Framework:

Research on military-induced separation has primarily focused on wives of servicemen (Black, W.G., 1993). Military spouses consider military-induced family separation as their major

dissatisfaction with military life (Styles, M.D., Janofsky, B.J., Blankinship, D., et al., 1990; Lund, D.A. 1978). Stress of separation is compounded when the military assignment involves combat duty, extended separation without communication, or service in extremely difficult circumstances. Symptoms of stress related to separation include increased physical illness, anxiety, grief, anger, guilt, loneliness, sleep disturbance, increased use of drugs and alcohol, low frustration level when dealing with children, and social isolation (Black, W.G., 1993; Nice, D.S., Beck, A.L., 1980; Hunter, E.J., Pope, M.A., 1981; McCubbin, H.I., Dahl, B.B., 1981). Thus, the questions arises, are these same stressors just as relevant to deployable servicewomen and their families.

The primary conceptual model for examining military-induced separation has been the ABC-X family stress model which studied families separated by war (Hill, R., 1949). This model has since been modified to the Double ABC-X model for further study of family adaptation to stressors (McCubbin, H.I., Patterson, J.M., 1982). Applying this conceptual model, the primary goal of much of the military family research has been to identify those stressors which families face and the resources used to cope with them. A consistent theme throughout this literature is that these stressors provide the potential for what is identified as "pile-up" of family life stressors (McCubbin, H.I., Patterson, J.M., 1982). Family and behavioral scientists have hypothesized that excessive stressors, particularly within a short period of time, may deplete a family's resources, making coping difficult and creating a high probability of family disruption. Research has found two sets of internal family resources that helped families cope with stress: Integration — the strength of a family's common interest, affection, cohesion interest, affection, cohesion, and unity; and Adaptability — a family's ability to be flexible in discussion and decision making (McCubbin, H.I., Boss, P., Wilson, L., et al., 1980).

Debate continues over whether or not military families are worse, better, or show little difference when compared to their civilian counterparts because of these stressors. Since the introduction of the ABC-X model, the stressors of military families have been labeled non-normative; however, as has been pointed out, many of these stressors have become normative to a peace-time military (Hill, R., 1949; Blaisure, K.R., Arnold-Mann, J., 1992). Military families often face unexpected stressors (delay in returning home from scheduled deployment, change in training schedule, threat of conflict); however, many of the stressors (relocation, long work hours, training deployments) are part of the military lifestyle and therefore expected.

More recently, a developmental model was introduced into the discussion of military families. Ideas have been presented about a developmental perspective for studying military families and can be paralleled by the developmental attachment theory to the feelings military couples experience when they undergo separation Gade, P., 1992; Vormbrock, J.K., 1993). This literature suggests that military families may cope differently with the stressors based on their developmental level. Family Development Theory indicates that families are working on developmental tasks specific to their position in the family life cycle.

The work and family role demands of adulthood are a stage of the life cycle. Work-family conflicts increase as one's obligations to family increase through marriage and the arrival of

children (Higgins, C., Duxbury, L., Lee, C., 1994). The roles of work and family are both demanding; and, therefore, conflict may arise from the simultaneous role demands (Steffy, B.D., Ashbaugh, D., 1986). This conflict may aggravate married life, resulting in lower levels of marital and family satisfaction, as well as creating job stress and physical strain (Steffy, B.D., Ashbaugh, D., 1986). It is also suggested that interrole conflict may be greater for working wives than working husbands (Graddick, M.M., Farr, J.L., 1983).

It is likely that military women will experience such conflict due to their nonstandard work schedule, deployment, and the high demands of military life. In order to balance work and family demands, military women must make difficult decisions regarding the planning of life cycle events. Such pressures surrounding these critical decisions can have a strong impact on all aspects of the lives of servicewomen.

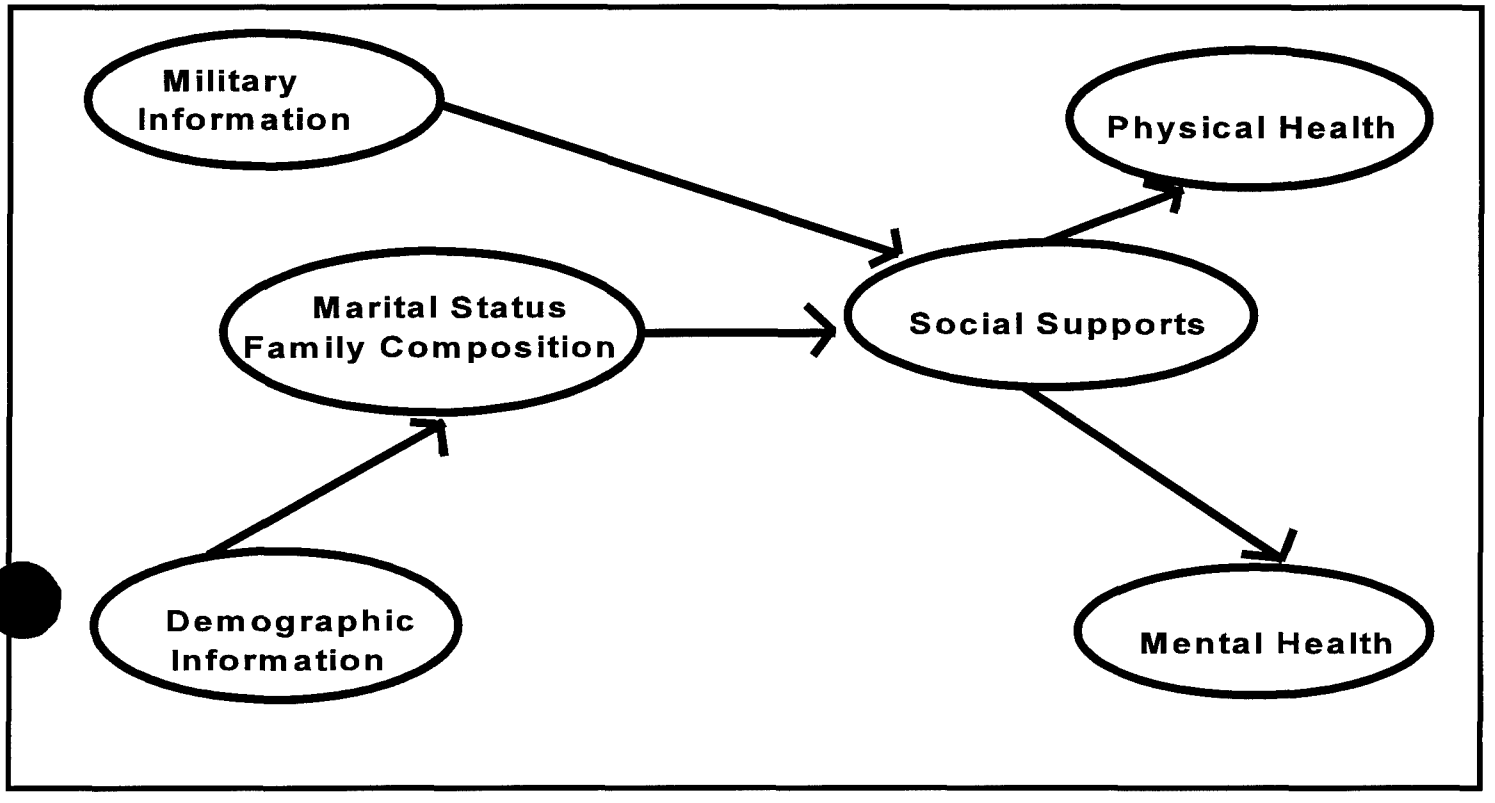
The average age of the partners for first marriage is about 25.4 for men and 23.6 for women (Witwer, M., 1993). Military personnel do not vary greatly from their civilian peers in terms of the age and developmental stage at which they marry. By 1991, the marriage rate for enlisted servicewomen was 47 percent; the majority of these women are married to servicemen (Office of the Assistant Secretary of Defense, 1992). Research also indicates that many women in the military have their first child between the ages of 20 to 24, which is comparable to that of their civilian counterparts (Thomas, P.J., Edwards, J.E., 1989; Sussman, M.B., Steinmetz, S.K., 1988).

It is likely that most stressors experienced by non-military families will also be common for military families; however, there may be specific stressors for military families throughout the life cycle. For example, it is suggested that newly married couples who are not yet attached to each other will have more difficulty coping with separation (Vormbrock, J.K., 1993). Research also suggests that families tend to adapt better after experiencing separation (Black, W.G., 1993). It has also been found the quality of

military life as perceived by the spouse and family is related to the service members' job performance and retention (Etheridge, R.M., 1989; Segal, M.W., Harris, J.J., 1993). This has significant implications in that families that do not adapt well to the military lifestyle may have poor health, perform poorly in their jobs, have poor family relationships, and/or separate from the military.

There are two extremely relevant issues related to the deployment of women. The first includes the phenomenon that the military is deploying increased numbers of servicewomen for training, humanitarian, and combat reasons. The second deals with the problem that very little research has addressed separation issues faced by servicewomen and their families. Consequently, questions remain unanswered as to the interaction between family relations and the physical health, mental health, and military experience of servicewomen. The following figure illustrates factors that are felt to be relevant as a result of literature.

Figure 1. Correlates of Health



LITERATURE REVIEW:

Deployment Issues for Family:

The family environment issue is a very important one when discussing effects of separation. Evidence clearly supports that separation may affect the health of all family members (Coolbaugh, K., Rosenthal, A., 1992; Rosen, L.N., Teitelbaum, J.M., 1993; Snyder, A.I., 1981). Overall, research has shown that military families may be more susceptible to spousal and child abuse, substance abuse, and illnesses because of the stress induced by separation (Coolbaugh, K., Rosenthal, A., 1992; Rosen, L.N., Teitelbaum, J.M., 1993; Snyder, A.I., 1981; Abbe, J.S., Naylor, G.S., Gavin, M., et al., 1986; Griffin, W.A., Morgan, A.R., 1988). The majority of this research, however, has focused primarily on the female spouse, rather than the military member, male or female. Little is known or discussed about how the military member deals with separation and the influence this may have on his or her health. The GAO Report also identified sources of stress for both deployed men and women as uncertainty of war, SCUD missile alerts, being away from families and friends, austerity of physical environment, lack of mail, rumor, military family policy, and uncertainty about when personnel would return home (U.S. General Accounting Office Report to the Secretary of Defense). The report further cited that differences in ability to cope with stress of deployment seemed to be more related to individual abilities rather than gender. It is also suggested that women may face more stress-related illnesses than men due to feeling pressure to prove themselves, role conflict to perform like a man, and the need to conform to the standards of femininity held by men (McBride, A.B., 1990; Rosen, L.N., Ickovics, J.R., Moghadam, L.Z., 1990). These stress-related illnesses seem more common for women assigned to traditional jobs than to nontraditional jobs (Hoiberg, A., 1984).

Similar to research on physical health and family issues related to military separations, the primary focus of mental health aspects has been on the spouse (primarily wife) and children of the deployed service member. Studies found family problems among children and spouses of service members to include phobias, somatic complaints, increased depression, anxiety, grief, anger, guilt, sleep disturbance, and loneliness (Coolbaugh, K., Rosenthal, A., 1992; Rosen, L.N., Teitelbaum, J.M., 1993; Abbe, J.S., Naylor, G.S., Gavin, M., et al., 1986; Nice, D.S., 1983). The level of stress caused by separation varies depending on the nature of the deployment (i.e., length of separation; combat or training deployment).

Despite the limited amount of research dealing with service member stress, all indications are that they do experience a

great deal of stress. Their stress is two-fold: the first
relates to feelings about separation and job, while the second deals with the concern over the well-being of the family (U.S. General Accounting Office Report to the Secretary of Defense). A study of Army Reserve nurses which was conducted prior to an anticipated mobilization to the Persian Gulf indicated that these women were significantly more anxious than a comparison group of civilian nurses. Within this group, having children was related to higher anxiety levels (Wynd,

C.A., Dziedzicki, R.E., 1992). Family structure also appears to influence readiness to deploy, and this decline in readiness may have long-term consequences during deployment (Burnam, M.A., Meredith, L.S., Sherbourne, C.D., et al., 1992).

Marital Relations:

The stress of separation has a major impact on the marital relationship. Again, the majority of research has focused on wives of servicemen rather than on the service member or even husbands of servicewomen. The absence of the military service member creates ambiguity of boundaries and roles and may create a great deal of conflict. Common problems for military spouses are loneliness, problems with children, and physical illness.[35] Newly married couples are particularly vulnerable to disruption caused by separation because they have had less time to solidify their relationship. Correlational to the life cycle, couples experiencing their first separation are likely to experience more negative effects than couples who have undergone multiple separations. Separation may, however, have beneficial effects as well, such as allowing for individual growth and for enhancement of the marital relationship (Segal, M.W., 1986).

Research on occupational commitment and marital adjustment found that perceptions of both men and women were that higher levels of occupational commitment by wives adversely affected marital adjustment (Ladewig, B.H., McGee, G.W., 1986). This finding was consistent with another study which found that greater work involvement of the wife (measured by hours worked per week) negatively affected the marital relationship (Booth, A., Johnson, D.R., White, L., et al., 1984). It is possible that these problems may be even greater for servicewomen who experience extended separation from their families due to deployment.

Research on maternal employment suggests that if a mother is satisfied in her employment, this spills over to her family life. A study found that mothers who were satisfied with their job were more autonomous and less anxious on reunion with their infants after separation (Wille, D.E., 1992). A study assessing depression in working women found that depression was more common in women who were working outside of the home who held a more traditional view of what their role should be within the family (Krause, N., Geyer-Pestello, H., 1985). The fact that mission readiness weighs heavily on the ability of personnel to focus on their duty must be recognized (Stremlow, M.V., 1990). It is crucial that military personnel feel confident that their well-being, as well as the well-being of their families, are an important concern and priority to their commanders.

Role Strain and Social Supports:

Evidence suggests that there is a relationship between recent stressful life events and psychological and physical disorders. The majority of attention has focused on the role that social support plays in moderating this stress-health relationship. Related to these stressful life events is the role strain women experience related to the multiple roles that they fulfill within the family and in their professional lives (Googins, B., Burden, D., 1987; Menninger, E.W., 1994). Research indicates that significant role strain exists for women who are single mothers and

married women with young children. Women who receive a high level of social support experience what is referred to as the "buffering hypothesis", which suggests that high levels of social support protect them from stress induced pathology(Cohen, S., Hoberma, H.M., 1983). This further supports the need for research regarding the role strain and social support which do or do not exist for women in the military.

Children and Separation From Their Parents:

The literature regarding military separation and children focuses on father absence and the reaction of the child to the separation, as well. What has been reported is inconclusive because a child's emotional and behavioral problems are not assessed prior to the father's absence (Jensen, P.S., Grogan, D., Xenakis, S.N., et al., 1989). Additionally, little has been reported on mother absence. What has been reported is that children manifest both emotional problems and behavioral problems (Hillenbrand, E.D., 1976; Jensen, M.P., Lewis, C.R., Xenakis, L.S., 1986). However, these problems are correlated with length of separations and number of separations. Lengthy separations appear to being about more detrimental effects than shorter ones, while first time separations may be the most difficult (Jensen, M.P., Lewis, C.R., Xenakis, L.S., 1986; Field, T.M., 1991).

Studies have also suggested that children exhibit more behavioral and emotional problems when the mother experiences difficulties handling management of daily activities, or when other members of the household experience psychological symptoms such as stress, depression, or anxiety (McCubbin, H.I., Dahl, B.B., 1976; Jensen, P.S., Bloedau, L., Degroot, J., et al., 1990; Rosen, L.N., Teitelbaum, J.M., 1993). Research also suggests that the emotional development of each parent, as well as the stability of their marriage, contributes to the child's emotional development and resiliency (Amen, D.G., Jellen, L., Merves, E.,
et al., 1988). Extrapolations from research on father absence can be made to assess the effects of a mother's absence on her children, but the implications could be more severe in nature. It can be anticipated that if children are negatively affected by separations from parents, the parent will in turn be affected.

With regard to maternal employment, research suggests that children whose mothers are employed full time are at risk for developing insecure attachments to their mothers, are more disobedient toward adults, and more aggressive toward peers (Belsky, J., Rovine, M., 1990; Belsky, J., Eggebeen, D., 1991). Research has found that mothers who prefer to be employed may become less anxious about separation from their infants because the two roles of mother and employee are integrated, as well as denial of anxiety about leaving the infant to pursue a career (DeMeis, D.K., Hock, E., McBride, S.L., 1986).

Child Care:

There are a number of problems associated with child care in the military (Stremlow, M.V., 1990). More than half of the U.S. military installations do not have organized child care centers, while those that do provide on-site child care only meet about 60 percent of the demand.

Additionally, extended waiting lists, hours that do not correspond with duty hours, and high costs signal this is an area of concern. Child care issues become compounded in times of deployment. Although research indicates there are no clear differences between males and females in regard to having sufficient child care arrangements for deployments, there is still significant concern regarding this issue for women (Schumm, W., Bell, D.B., Palmer-Johnson, C.E., et al., 1994). Child care is also significantly related to multiple role strain for working women (Schumm, W., Bell, D.B., Palmer-Johnson, C.E., et al., 1994). When a servicewoman deploys, if married, she must be able to rely on her spouse to provide primary care, and data indicates that servicewomen are less confident that their spouses can take full responsibility for family matters during deployment than servicemen (Burnam, M.A., Meredith, L.S., Sherbourne, C.D., et al., 1992). If she is a single parent, or married to another service member who is susceptible to deployment, she must ensure that sound child care arrangements are in place. A recent study of Army personnel found that women and soldiers in dual military marriages were more likely to report that child care arrangements were "fair" or "poor." (Burnam, M.A., Meredith, L.S., Sherbourne, C.D., et al., 1992). Therefore, additional research is needed to substantiate the effectiveness of child care arrangements and to what extent this issue affects the physical and mental health of servicewomen.

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B.7 **REPORT TOPIC AREA**: **Prevalence Rates of Upper Respiratory Disease Symptoms and Reported Shipboard Conditions and Exposures Among Active Duty Navy Personnel Assigned to Ships**

PROPOSED LEAD AUTHOR: Edward D. Gorham, M.P.H.

ABSTRACT:

This report will focus on the upper respiratory tract infections which are the most common infectious diseases in the United States in adults, and pose a considerable health threat to the shipboard population. Many viral agents known to cause acute respiratory illness are transmissible through indoor air. Historically, military populations aggregated for training or deployment have experienced high incidence rates of acute upper respiratory infections (URI), and URI is the leading cause of outpatient illness in active-duty Navy personnel assigned to ships. However, the associations between shipboard ventilation and crowding in living spaces with incidence rates of upper respiratory infections are not well defined. This report will be designed to assess the relationship between incidence rates of acute URI as determined from sick call visits aboard a Navy aircraft carrier during deployment and ventilation characteristics (including rate of air change in cubic feet per minute, percent fresh air and number of square feet per person based on personnel berthing assignments).

HYPOTHESIS:

Berthing space crowding (square feet per person) is not positively related to incidence of sick call visits in active-duty Navy personnel living aboard an aircraft carrier during deployment (N=5000).

Berthing space ventilation rate (cubic feet of air per minute) and ventilation index (cubic feet of air per minute per person) are not inversely related to incidence of sick call visits during deployment in active-duty Navy personnel living aboard an aircraft carrier (N=5000).

Berthing space percent fresh air is not inversely related to incidence of sick call visits during deployment in active-duty Navy personnel living aboard an aircraft carrier (N-5000).

Primary Objectives:

To evaluate the potential relationship between crowding in berthing areas and incidence of sick call visits for URI.

To evaluate the potential relationship between ventilation characteristics in berthing areas and incidence of sick call visits for URI.

To determine incidence rates of sick call visits for URI by work division, berthing space, age, race, and gender.

To describe the temporal association between port call visits and frequency of URI sick call visits.

Additional Objectives:

To determine if self-reported occupational exposure to dust, vapors, or fumes is positively related to incidence of sick call visits for URI (N=700[1]).

To determine if self-reported cigarette smoking is positively related to incidence of sick call visits for URI (N=700[1]).

To determine if self-reported passive smoke exposure or active smoking is positively related to incidence of sick call visits for URI (N=700[1]).

ANALYSIS PLANS:

Study Population:

The study population for the testing of primary hypotheses will consist of approximately 5,000 active-duty enlisted and officer personnel serving aboard a U.S. Navy aircraft carrier. For secondary hypotheses, 350 women and 350 men, matched on pay grade, work division, occupation, race, and date of birth ± 3 years, will fill out a questionnaire that will ascertain self-reported occupational exposures, active and passive smoking, and URI symptoms.

Crowding and Ventilation Measurement:

Individual information on work division and sleeping quarters will be obtained through rosters from the Personnel and Supply Divisions aboard ship. Populations at risk for berthing spaces and work divisions will be determined using these rosters. Ventilation and design specifications of berthing spaces will be determined from technical drawings available at the U.S. Navy Technical Library located at the 32nd Street Naval Station in San Diego. From these sources, a crowding and ventilation index will be determined for the ship berthing spaces (N=70). To further describe ventilation characteristics in berthings areas, average overnight ambient carbon dioxide levels will be measured in a sample of berthing compartments using Draeger Direct Reading Diffusion Tubes. Incidence rates for URI will be determined using sick call visit logs.

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[1] 350 women and a matched sample of 350 men, matched on pay grade, work division, occupation, race, and date of birth, ± 3 years.

Case Definition:

Patients presenting to sick call with a sore throat, runny nose, cough, or sneezing, without a self-reported history of a respiratory allergy within the past 90 days will be defined as cases. Fever will be noted if present. This definition is designed to capture acute respiratory diseases of known or suspected viral origin (ICD-9 codes 460-466,480). The case definition will exclude diagnoses of streptococcal infections (ICD-9 code 034), allergic rhinitis (ICD-9 code 477), influenza (ICD-9 code 487), and bacterial pneumonias (ICD-9 codes 481-483), although these will be ascertained and subject to surveillance. Only first presentation for an individual within a 30-day period will be accepted. Follow-up visits for the same individual within a month of the first diagnosis will be excluded. Criteria are listed in Attachment 3.

Sample Size and Power:

Expected Incidence of URI:

The incidence of URI in this population is expected to be approximately 28 to 43 per 1,000 per month based on previous experiences of deployed U.S. Navy aircraft carriers (Table 1).

Statistical Power:

This study is planned to have sufficient power for the testing of primary hypotheses to detect relative risks in the range of 1.3 to 1.5 assuming a multiple logistic model, analyses by quartiles, a 2-sided alpha level of 0.05, and 80 percent power.

Analysis Plan:

Using a prospective study design, incidence rates will be determined by age, gender, race, work division, occupation, pay grade, berthing space crowding index, berthing space ventilation rate, ventilation rate in cubic feet per minute per person, and percent fresh air (N=5000). In a subgroup (N=700), incidence rates will also be determined by self-reported occupational exposures, smoking status, and passive smoke exposure.

The main hypotheses will be tested using logistic regression with the dependent variable being incidence of upper respiratory infection and independent variables of crowding index, ventilation rate, and percent of fresh air (quartiles). Potential confounding variables include race, gender, age, work division, and pay grade. To evaluate the potential association between crowding and ventilation indices in berthing areas with incidence of sick call visits for those berthing areas, scatterplot diagrams will be constructed and the appropriate correlation statistic will be applied. A Pearson correlation coefficient will be used if the ventilation index and incidence rates are distributed normally by berthing area. Spearman's Rank or Kendall's Tau correlation coefficients will be used if either variable is not normally distributed or cannot be readily transformed.

Respiratory disease frequency and incidence by ship size and deployment, U.S. Navy, 1967–1985								
Overall illness frequency and incidence per 1000 per day, Indian Ocean Deployment, 1985								
	Small		Medium		Large		Expected number* aboard aircraft carrier with 5000	
Respiratory Disease	Destroyers/frigates (N=3)		Cruisers (N=1)		Carriers (N=2)			
	Frequency	Rate	Frequency	Rate	Frequency	Rate	in 1 month	in 3 months
URI	106	2.24	34	1.9	650	1.44	216	648
Influenza	5	0.11	0	0.0	323	0.72	108	324
Overall illness frequency and incidence per 1000 per day, European Deployment, 1985								
	Small		Medium		Large		Expected number* aboard aircraft carrier with 5000	
Respiratory Disease	Destroyers/frigates (N=5)		Cruisers (N=3)		(Carriers (N=1)			
	Frequency	Rate	Frequency	Rate	Frequency	Rate	in 1 month	in 3 months
URI	438	3.58	235	4.04	147	0.96	144	432
Influenza	40	0.33	8	0.14	24	0.16	24	72

*based on the incidence rate aboard carriers in this deployment

Source: Blood CG, Griffith DK, Ship size as a factor in illness incidence among US Navy vessels. Mil Med. 1990; 155:310-314.

LITERATURE REVIEW:

Acute upper respiratory infections (URIs) encompass a large group of illnesses of known or suspected viral origin, but which can be complicated by bacterial infection (Benenson, A.S., Ed., 1990). Clinically, URIs are often divided according to whether fever is present. Known viral agents causing acute febrile respiratory diseases (ICD-9 codes 461-466,480) include parainfluenza viruses, adenoviruses, rhinoviruses, respiratory syncytial virus, and some coronaviruses, coxsackieviruses, and echoviruses. The symptoms of these viral infections include fever, headache, general achiness, and cold-like symptoms. The other major category of URIs in which fever is generally absent, except in young children, is the common cold (ICD-9 code 460). These infections are characterized by sneezing, lacrimation, nasopharyngeal irritation, and chilliness (Benenson, Ed., 1990). Over 100 serotypes of rhinovirus have been identified as agents for colds, along with a few coronaviruses, but virus can be demonstrated in cell or tissue culture in only 20 to 35 percent of cultured cases (Benenson, Ed., 1990). It has been estimated that the etiologic agents responsible for almost one-half of all colds are unknown (Benenson, Ed., 1990; Garibaldi, 1985).

Health and Social Impact of URIs:

Upper respiratory tract diseases are the most common infectious diseases among adults in the United States (Garibaldi, 1985). Acute URIs also cause significant morbidity and mortality among children and older adults (Benenson, Ed., 1990). The health threat which URIs pose to children and older adults, and the magnitude of acute disability which URIs account for in adults, make them a major health and economic concern. In the United States, acute respiratory disease annually accounts for an estimated 1.25 million hospitalizations and 75 million physician visits. The direct medical costs for URIs have been estimated at 15 billion dollars annually, and the indirect cost associated with absenteeism and lost income due to URIs approaches 60 billion dollars annually (Dixon).

Historical Background:

Outbreaks of acute respiratory disease, pneumonia, and influenza have been documented during mobilization and deployment of military populations since at least 1500 A.D. (Paine). Acute respiratory diseases were responsible for 42 percent of all illness and 78 percent of all disease deaths in WWI (Love, 1922). Respiratory disease outbreaks occurred among workers on the Panama canal and in mines in South Africa (Gorgas, 1914). In a classic review, Finland (1942) noted that pneumonia outbreaks in these populations were associated with overcrowding, and the highest attack rates occurred among new laborers. As early as 1880, the Surgeon General of the Navy reported that respiratory diseases were the most common illnesses among sailors (U.S. Government Printing Office, 1880).

Because of the impact that respiratory disease, particularly influenza and other infectious diseases, had on military personnel, the U.S. Department of War established a board in 1941 for

the "Investigation and Control of Influenza and Other Epidemic Diseases in the Army." This board later became the Armed Forces Epidemiological Board (U.S. Government Printing Office, 1990). A large portion of the modern understanding of the epidemiology of respiratory disease is due to the work of military and civilian scientists associated with this board. This research led to major advances in the prevention of respiratory diseases, including development of influenza vaccine, adenovirus vaccine, purified polysaccharide pneumococcal vaccine, and antibacterial prophylaxis against Streptococcus pyogenes.

Despite these advances, however, and several epidemiologic and serologic investigations of acute URI in military (Hoeffler, 1975; Miller, 1964; Brundage, Scott, Lednar, et al, 1988; Evans, 1975) and civilian populations (Robertson, Burge, Hedge, et al, 1985; Sterling, Sterling, 1983), acute upper respiratory disease is still the leading cause of outpatient morbidity in many civilian and military populations, including active-duty Navy personnel assigned to ships (Gray, Mitchell, Tueller, Cross, Amundson, 1994).

Rationale for the Primary Objectives:

Ventilation, Crowding, and URI. Many of the leading infectious agents known to cause respiratory illness are transmissible through indoor air (Couch, 1981; Dick, Jennings, Mink, et al, 1978). A few studies have reported associations between ventilation characteristics of buildings and acute upper respiratory disease incidence (Brundage, Scott, Lednar, et al, 1988; Robertson, Burge, Hedge, et al, 1985; Sterling, Sterling, 1983). Brundage, et al (1988) found that incidence rates of acute febrile respiratory diseases at four Army training centers were fifty percent higher in buildings with closed ventilation systems. A cross-sectional survey reported that rhinitis was five times as prevalent (28 percent versus 5 percent) in air-conditioned buildings compared with naturally ventilated buildings (Robertson, Burge, Hedge, et al, 1985).

It is hypothesized that the ventilation characteristics of shipboard berthing spaces and the density and spatial relationships of their occupants may place some personnel at increased risk of URIs. Additionally, the aggregation of susceptibles in the ten air wings (N=200 each) at the beginning of the voyage may place these personnel (who share berthing spaces) at increased risk of URI. The temporal relationship between port call visits and URI admission frequency will also be determined for all ship personnel (N=5000).

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B.8 **REPORT TOPIC AREA: Descriptive Tables of Demographic Characteristics, Family Structure, and Women's Health-Related Issues, and Occupational Exposures of Personnel Participating in the U.S. Navy Women Aboard Ship Study**

PROPOSED LEAD AUTHOR: Frank C. Garland, Ph.D. and David S. Timberlake, M.P.H.

ABSTRACT:

This report will include development of a report entitled "Incidence Rates of Disease and Injury Occurring Aboard Ship Report." This report will provide incidence rates of newly diagnosed cases of the specified disorders in women aboard ship. For example, incidence rates of adult-onset asthma, kidney infections, and other disorders listed can be calculated using the shipboard female population as the population at risk.

HYPOTHESIS:

Incidence rates of newly diagnosed cases can be calculated using the shipboard female population as the population at risk.

ANALYSIS PLANS:

Medical History Section:

Variables:

Independent:

The section of the questionnaire being examined obtains personal history of 10 medically-diagnosed diseases: asthma, migraine, anemia, depression, gonorrhea, syphilis, chlamydia, urinary tract infection, kidney infection, and hernia.

Dependent:

Subsequent sick call visits, hospitalizations, and self-reported medical conditions.

Co-variables:

Age, race, gender, occupation.

Item(s): Questionnaire Item 21, all forms. This is a closed-ended question with 10 categories, one for each diagnosis, and a position for marking age at first diagnosis.

Statistics:

Hypothesis Testing:

Hypotheses involving this section will be tested using contingency tables (Fleiss, 1981 #4), relative risk, 95 percent confidence intervals on relative risks (Katz, 1978 #3), and multiple logistic regression (Hosmer, 1989 #5) (Breslow, 1980 #8).

Descriptive:

Incidence rates of sick call visits will be reported according to medical history, with confidence intervals calculated using the Poisson (Lilienfeld, 1993 #6) or binomial confidence intervals (Armitage, #7).

Sample Size: N=10,000 (5,000 women and 5,000 men)

Item(s): Questionnaire Items 22-24, all forms. These are closed-ended questions, including yes/no items, and dates.

Statistics:

Hypotheses Testing:

Hypotheses involving this section will be tested using contingency tables (Fleiss, 1981), relative risk, 95 percent confidence intervals on relative risks (Katz, 1978), and multiple logistic regression (Hosmer, 1989; Breslow, 1980).

Descriptive:

Incidence rates of sick call visits will be reported according to medical history, with confidence intervals calculated using the Poisson (Lilienfeld, 1993) or binomial confidence intervals (Armitage).

Sample Size: N-10,000 (5,000 women and 5,000 men)

Validation Potential:

Diagnoses that were made during a hospitalization at a military health care facility can be verified using the CHAMPION database.

OB–GYN Availability:

Availability of medical supplies and equipment and OB–GYN care is an important issue needing evaluation aboard ship. It has also been speculated that some of the OB–GYN conditions encountered during deployment could have been detected and dealt with before deployment, but that appointment schedules did not accommodate women awaiting deployment.

Item(s): Questionnaire Items 22-24, all forms. These are closed-ended questions, including yes/no items, and dates.

Statistics:

Hypotheses Testing:

A report will be developed involving testing and using the contingency tables (Fleiss, 1981), relative risk, 95 percent confidence intervals on relative risks (Katz, 1978), and multiple logistic regression (Hosmer, 1989; Breslow, 1980).

Descriptive:

Incidence rates of sick call visits will be reported according to medical history, with confidence intervals calculated using the Poisson (Lilienfeld, 1993) or binomial confidence intervals (Armitage).

Sample Size: N-10,000 (5,000 women and 5,000 men)

Validation Potential:

Diagnoses that were made during a hospitalization at a military health care facility can be verified using the CHAMPION database.

Recent Medical Care:

This section is not designed to produce a report per se, but rather to allow testing of hypotheses based on data from other sections of the questionnaire or sick call logs. This work will develop a data set consisting of date last seen by M.D., other professional, and hospital corpsman, and, for deployed personnel, date the individual was medically screened preceding deployment.

Variables:

Independent:

Date last seen by M.D., other professional, and hospital corpsman, and, for deployed personnel, date the individual was medically screened preceding deployment.

Dependent:

Subsequent sick call visits, hospitalizations, and self-reported medical conditions.

Co-variables:

Age, race, gender, occupation.

LITERATURE REVIEW: None.

BIBLIOGRAPHY: None.

B.9 **REPORT TOPIC AREA**: **Pregnancy Among Enlisted Women Aboard Ships**

PROPOSED LEAD AUTHORS: Marie D. Thomas, Ph.D. and Patricia J. Thomas, M.A.

ABSTRACT:

This report will focus on pregnancy, use of contraception, and family planning attitudes. The following topics will be explored: the interrelationships among family planning attitudes, contraceptive behavior, and unplanned pregnancy. In addition, the effects of psychosocial stress and lifestyle behaviors on contraceptive use and rates of pregnancy and contraceptive use for the sample as a whole and within various subgroups will also be explored.

HYPOTHESIS: (A representative, but not exhaustive, list)

Pregnancy rates will be highest among women under the age of 25.

Family planning attitudes and contraceptive use will be related to age, education, marital status, and parental status.

Lifestyle behaviors (such as drinking, smoking, diet, sleep, and exercise) and utilization of health care services will be related to contraceptive behaviors.

There will be a relationship between psychosocial variables (such as stress and depression), use of contraception, and perceived probability of becoming pregnant in the next 12 months.

Women and men will differ in their family planning attitudes and beliefs regarding contraception.

ANALYSIS PLANS:

Compute current and 12-month pregnancy rates.

Assess pregnancy outcomes.

Determine the demographic variables associated with pregnancy while aboard ship, use of contraception, family planning attitudes.

Determine the variables associated with unplanned pregnancies.

Determine the relationship between contraceptive use and family planning attitudes.

Determine factors associated with high probabilities of becoming pregnant in the next 12 months.

Explore the relationship between use of contraception and other self-care health-related behaviors.

Variables of Interest:

Items associated with planned and unplanned pregnancy, contraceptive availability and use, and family planning.

Demographic variables (such as age, marital status, race/ethnicity, pay grade, level of education, current ship status, deployment status.

Lifestyle measures and psychosocial variables (such as psychological distress, stress, friends and family).

Statistics:

Data analysis will make use of a full range of descriptive statistics. Hypothesis testing will be conducted through the use of chi-square and t-tests, analysis of variance and multi variate analysis of variance. Multi variate analytic techniques to be used to determine patterns of relationships between and among variables of interest include multiple regression and discriminant analysis.

LITERATURE REVIEW:

Most of the theoretical literature on pregnancy and contraceptive use has focused on adolescents. For example, Oskamp and Mindick (1983) performed two longitudinal studies on adolescent contraceptive use. Good and poor contraceptors differed in several ways: good contraceptors (1) had superior contraceptive knowledge; (2) were superior on measures of peer relationships, planfulness, and socialization; and (3) were higher on attitudes and intentions that were consistent with effective use of birth control.

The relationships between demographic variables and pregnancy among civilian women of child-bearing age are well documented (e.g., Tanfer & Horn, 1985). Research with military populations has found fewer correlates, however. Royle & Thomas (in press), for example, reported no relationship between race and pregnancy among Navy women in their first enlistment. The greater homogeneity of military women as compared to civilian women is partially responsible for these results, but other factors should be explored. Among civilians, user characteristics also are related to contraceptive failure rates—more so than method of contraception (Jones & Forrest, 1992). Although a demonstration of this relationship would

identify at-risk military populations for interventions, similar analyses have not been conducted among servicewomen.

Several researchers have investigated the effect of pregnancy on relationships within military workgroups (Correnti & Jensen, 1989; Thomas, Thomas & McClintock, 1991). Supervisory treatment and attitude, particularly in operational units such as ships, was found to have changed more than co-worker relationships. Whether these changes, which tended to be negative, created psychosocial stress among pregnant women has not been documented.

The Navy has conducted several applied studies on pregnancy aboard ships. Most relevant to this project is the information gained from three surveys that were administered in 1988, 1990, and 1992 (Thomas & Edwards, 1989; M. Thomas & P. Thomas, 1993). Major findings are:

The point-in-time pregnancy rate for enlisted women has been very consistent over this period, ranging from 8.4 percent to 8.9 percent. The rate of pregnancy is highest for women who are E-4 and below. In terms of age, almost 65 percent of the women who were pregnant at the time of the 1992 survey were under the age of 25.

Most of the higher pay grade women (E-6 and above) who were pregnant at the time of the 1992 survey were married. There is some validity to the perception that many of the younger pregnant women are single; 64 percent of the pregnant E-2s and 49 percent of the pregnant E-3s were single.

More than half (59 percent) the pregnancies reported in the 1992 survey were unplanned. This has been a consistent finding over the three surveys. Of the women who became pregnant unintentionally, 56 percent reported that they had been using birth control. The two most common methods used by women who became pregnant were condoms and the contraceptive pill.

Abortion rates tend to be low (between 15 percent and 17 percent), except among E-2s. This low abortion rate is probably at least partly the result of the fact that the military is prohibited from performing or paying for the abortions of active-duty women or dependents except in very limited circumstances.

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B.10 **REPORT TOPIC AREA**: **Menstrual and Reproductive Health Conditions Among Women in the Navy**

PROPOSED LEAD AUTHORS: Donna Kritz-Silverstein, Ph.D. and Deborah L. Wingard, Ph.D.

ABSTRACT:

This report will describe the prevalence of disorders associated with the menstrual cycle and reproductive system, and time lost from work due to these disorders in women aboard Navy ships. Ovulatory and menstrual disturbances have been associated with stress (Merikangas, K.R., Foeldenyi, M., Angst, J., 1993; Carpenter, S.E., 1994). This report will compare the prevalence of disorders related to menstruation and the menstrual cycle and time lost from work by deployment status, pay grade, and rating. Among women who report having experienced symptoms within the previous 90 days, deployed and non-deployed women will be compared in terms of development of new conditions and worsening of existing conditions.

HYPOTHESIS:

It is expected that the prevalence of symptoms will increase with increasing age and be higher among ethnic/racial minorities. It is also expected that deployed women will experience a higher prevalence of symptoms than non-deployed women. Among women who report experiencing symptoms within the previous 90 days, deployed women are expected to have a higher incidence of symptoms, a greater prevalence of symptoms that increased in severity, and higher rates of time lost from work due to symptoms. Because women who have a lower pay grade and rating may have jobs with less control, and to the extent that having less control is more stressful, it is also expected that there will be an inverse association of pay grade and rating with the prevalence and incidence of symptoms and the prevalence rate of time lost from work due to these symptoms.

ANALYSIS PLANS:

Variables:

Independent Variables and Co-variates: Age, race/ethnicity, deployment status, pay grade, and rating

Dependent Variables (in separate analyses): cramps or pain during menstrual period requiring medication or time off work; bleeding between periods; excessive frequency of periods (time between periods too short); heavy periods (excessive menstrual flow); period lasting longer than one week; scanty menstrual flow; irregular periods; other symptoms related to menstrual periods; abdominal pain from endometriosis; abdominal pain from know cysts; abdominal pain from other or unknown causes; missing two or more hours from work during the previous ninety

days due to symptoms or disorders of the reproductive systems; and missing one or more days of work during the previous ninety days due to symptoms or disorders of the reproductive system.

Statistical Analyses:

Frequencies will be computed for each of the dependent variables to yield the overall prevalence of symptoms and time missed from work. Stratification by age (less than 20, 20-24, 25-29, 30-34, 35-39, and 40 and older) and comparisons with chi square analyses will be used to examine the age-specific prevalence rates. Prevalence rates after stratification by race-ethnicity, deployment status, pay grade and rating will also be examined. Age- and race-adjusted comparisons by deployment status of the prevalence of each symptom, of time lost from work, of the incidence of new symptoms, and of the prevalence rate of symptoms that increased in severity will be accomplished with the Mantel-Haenszel extension test and logistic regression analyses. Similarly, age-adjusted comparisons by pay grade and by rate of each symptom that increased in severity will also be accomplished with the Mantel-Haenszel extension test and logistic regression analyses.

Secondary Analyses:

Secondary analyses will also describe the prevalence rates of breast disorders (lumps, discharge); other disorders of the female reproductive tract (such as urinary tract infections, vaginal rash or discharge, gonorrhea, and other sexually transmitted diseases); and the time lost from work due to these disorders. These analyses will be similar to those described for menstrual related symptoms and will also be adjusted for age and stratified by race/ethnicity, deployment status, pay grade and rating.

Other secondary issues to be addressed in this report include the associations of lifestyle factors with menstrual symptoms and other disorders of the reproductive system. Age, obesity, and lifestyle factors, such as cigarette smoking, exercise, alcohol consumption, and stress, have been reported to affect the menstrual cycle and menstrual disorders. For instance, older women have been found to report less dysmenorrhea than younger women (Sundell, G., Milsom, I., Andersch, B., 1990; Ng, T.P., Tan, N.C., Wansaicheong, G.K., 1992; Heisterberg, L. 1993; Kritz, D.C., 1985). Weight loss has been associated with irregular periods and amenorrhea (Carpenter, S.E., 1994; Falsetti, L., Pasenetti, E., Mazzini, M.D., Gastaldi, A., 1992). Cigarette smoking has been associated with shorter cycle length, increased dysmenorrhea, and menopause that occurs on average one to two years earlier than for nonsmokers (Sundell, G., Milsom, I., Andersch, B., 1990; Parazzini, F., Tozzi, L., Mezzopane, R., et al, 1994). Higher alcohol consumption has been associated with increased premenstrual symptoms (Caan, B., Duncan, D., Hiatt, R., et al, 1993); however, others have reported no association between alcohol consumption and dysmenorrhea (Parazzini, F., Tozzi, L., Mezzopane, R., et al, 1994; Tate, D.L., Charette, L., 1991). Exercise has been frequently recommended for treatment of dysmenorrhea (Greene, J.W., 1993). However, excessive exercise has been associated with delayed menarche, lack of ovulations, and the absence of menstrual periods (Janiger, O.,

Riffenburgh, R., Kersh, R., 1972; Green, J.W., 1993; Keizer, H.A., Rogol, A.D., 1990; Loucks, A.B., 1990). Similarly, stress and nulliparity have been associated with increased menstrual problems (Sundell, G., Milsom, I., Andersch, B., 1990; Ng, T.P., Tan, N.C., Wansaicheong, G.K., 1992; Hasin, M., Dennerstein, L., Gotts, G., 1988; Janiger, O., Riffenburgh, R., Kersh, R., 1972; Merikangas, K.R., Foeldenyi, M., Angst, J., 1993; Carpenter, S.E., 1994; Lee, K.A., Rittenhouse, C.A., 1991).

Most of the previous studies of menstrual disorders have relied on either clinic- or physician-based samples of women, or samples of college students. The present database is unique in that it will enable us to examine the associations of each of these variables with the prevalence of menstrual disorders and other conditions affecting reproductive health using data from women in the Navy. Comparisons can also be made among deployed and non-deployed women to determine if the patterns of association differ among these two groups of women and if deployment has a negative impact on women's reproductive health. Specifically, we will examine the associations of:

Obesity with the prevalence of menstrual disorders and other disorders of the female reproductive system. It is expected that thinner women will have a greater prevalence of symptoms and a higher prevalence of time lost from work due to symptoms. Body mass index (BMI) will be calculated (weight in kilograms/height in meters^2) (question 39) and age-adjusted comparisons of the prevalence rate of each symptom and of time lost from work due to symptoms by quartile of BMI will be performed with the Mantel-Haenszel extension test and/or logistic regression. Separate comparisons will also be performed after stratification by deployment status, pay grade, and rating.

Cigarette smoking (questions 27-32) with the prevalence of menstrual disorders and other disorders of the female reproductive system. It is expected that women who currently smoke cigarettes will have a greater prevalence of symptoms and time lost from work, whereas women who have never smoked cigarettes will have the lowest prevalence of these variables, and women who are past smokers will be intermediate in their prevalence rates. Age-adjusted comparisons of the prevalence of each symptom and of time lost from work due to symptoms by smoking status will be performed with the Mantel-Haenszel extension test and/or logistic regression. Separate comparisons will also be performed after stratification by deployment status, pay grade, and rating.

Exercise (questions 47-48) with the prevalence of menstrual disorders and other disorders of the female reproductive system. It is expected that women who engage in moderate exercise will have the lowest prevalence of symptoms and the lowest rates of time lost from work due to these symptoms. Women who engage in the least amount of exercise are expected to have the greatest prevalence of cramps or pain during the menstrual cycle, abdominal pain, other menstrual disorders, and time lost from work due to symptoms. Women who have the greatest amounts of heavy exercise are expected to report the greatest prevalence of irregular menstrual cycles, missed periods, and periods with scanty menstrual flow. Age-adjusted comparisons of the prevalence of

each symptom by exercise status will be performed with the Mantel-Haenszel extension test and/or logistic regression. To test the possibility of a U-shaped relation between exercise and symptom prevalence, a quadratic component will be added to logistic regressions. Separate comparisons will also be performed after stratification by deployment status, pay grade, and rating.

Stress (forms 456 and 78, questions 42-45) with the prevalence of menstrual disorders and other disorders of the female reproductive system. A positive association is expected between stress scores and the prevalence of symptoms and time lost from work due to these symptoms. Scores on the measures of stress will be calculated and age-adjusted comparisons of the prevalence of each symptom and of time lost from work due to symptoms by quartile of stress score will be performed with the Mantel-Haenszel extension test. Logistic regression will be used to examine the association of stress scale score with each of the symptoms and time lost from work due to these symptoms after adjustment for age. Separate comparisons will also be performed with adjustment and stratification by deployment status, pay grade, and rating.

Pregnancy history (questions 61 and 64) with the prevalence of menstrual disorders and other disorders of the female reproductive system. An inverse association is expected between the number of pregnancies and number of births and the prevalence rates of symptoms and time lost from work due to symptoms. Age-adjusted comparisons of the prevalence of each symptom and of time lost from work due to these symptoms by number of pregnancies and by number of births will be performed with the Mantel-Haenszel extension test. Logistic regression will be used to examine the association of pregnancies and births with each of the symptoms and of time lost from work due to these symptoms after adjustment for age. Separate comparisons will also be performed after stratification by deployment status, pay grade, and rating.

Logistic regression models will also be used to examine the independent and synergistic effects of these variables (age, race/ethnicity, obesity, cigarette smoking, exercise, alcohol consumption, stress, and pregnancy history) on the prevalence and incidence of each symptom and time lost from work due to these symptoms.

LITERATURE REVIEW:

It has been estimated that 50-85 percent of the 15 million menstruating women in the United States suffer to one degree or another from dysmenorrhea and other menstrual and premenstrual symptoms (Budoff, P.W. 1981; Sundell, G., Milsom, I., Andersch, B. 1990; Ng, T.P., Tan, N.C., Wansaicheong, G.K. 1992). Endometriosis is a disease of the female pelvic mesenchyme in which tissue with epithelial and stromal characteristics of the endometrium develops in a situation other than in the uterus (Ajossa, S., Mais, V., Guerriero, S., et al, 1994). The reported prevalence of endometriosis ranges from a low of 1-8 percent (Barbieri, R.L., 1990; Mahmood, T.A., Templeton, A. 1991; Vercellini, P., Crosignani, P.G. 1993) to 22 percent among nonpregnant women and 16 percent among pregnant women (Moen, M.H., Muus, K.M. 1991; Wardle, P.G., Hull, M.G. 1993). As many as 54 percent of all women with endometriosis report chronic pelvic pain, and as many as 81 percent also complain of dysmenorrhea (Marana,

R., Muzii, L., Caruana, P., et al, 1991). Menstrual symptoms also vary with age (Sundell, G., Milsom, I., Andersch, B., 1990; Ng, T.P., Tan, N.C., Wansaicheong, G.K., 1992; Heisterberg, L. 1993; Kritz, D.C., 1985) and race/ethnicity (Kritz, D.C., 1985; Janiger, O., Riffenburgh, R., Kersh, R., 1972).

For some women, the symptoms associated with the menstrual cycle are severe enough to cause a disruption in their daily activity (Sundell, G., Milsom, I., Andersch, B., 1990; Ng, T.P., Tan, N.C., Wansaicheong, G.K., 1992). These symptoms are responsible for more lost work and school hours among women than any other disease entity (Budoff, P.W. 1981; Sundell, G., Milsom, I., Andersch, B. 1990; Ng, T.P., Tan, N.C., Wansaicheong, G.K. 1992; Dingfelder, J.R., 1982). Approximately 5-15 percent of all women (almost 3.5-7 million American women) are incapacitated for 1-2 days each month because of their symptoms (Budoff, P.W., 1981; Norris, R.V., Sullivan, C., 1983; Holmlund, U., 1990). Thus, the experience of menstrual and reproductive system disorders may create an economic burden for employers as well as for the women themselves. However, there have been relatively few large, population-based studies of the prevalence of menstrual and reproductive system disorders and the time lost from work due to dysmenorrhea or other symptoms.

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B.11 **REPORT TOPIC AREA**: **Women Aboard Navy Ships: Life Style Behaviors and Health Promotion Issues**

PROPOSED LEAD AUTHOR: Terry L. Conway, Ph.D. and Frank C. Garland, Ph.D.

ABSTRACT:

Using data from the shipboard questionnaire and comparative data from women ashore and civilian women, this report will investigate life style behaviors such as tobacco and alcohol use, physical activity, and weight management. It will focus primarily on individuals' perceived access to counseling services related to life style and other health-related behaviors (e.g., family planning/birth control methods, stress management, and drug/alcohol abuse counseling).

HYPOTHESIS:

This report will primarily focus on providing comprehensive descriptive information on Navy women assigned shipboard duty, comparing shipboard women with shipboard men, and (to the extent that data are available) comparing shipboard women to both shore-based (e.g., POWR'95) and civilian women (e.g., NHIS/NHANES data). Several specific objectives include the following:

Provide in-depth descriptive statistics by standard demographic categories indicating prevalence of both health-promoting and health-detrimental lifestyle behaviors (e.g., physical activity/exercise, tobacco use, secondary exposure to tobacco smoke, alcohol use, weight loss/gain, hours of sleep per day).

Provide in-depth descriptive statistics by standard demographic categories indicating perceived accessibility of Navy health-promotion services (e.g., counseling regarding family planning/ birth control, other medical concerns).

Test for gender differences among shipboard personnel in prevalence of lifestyle behaviors and perceived accessibility to health-promotion counseling services.

Examine associations (and test replications from the literature, when available) among lifestyle behaviors, between lifestyle behaviors and perceived accessibility of counseling services, and between both of these categories of variables with health-related outcome variables (e.g., sick call visits, self-reported health conditions).

ANALYSIS PLANS:

Statistical Analysis and Hypothesis Testing:

Primary data analyses will be performed using the SPSS for Windows statistical package. Basic descriptive information will be assessed by determining frequency counts and percentages or means and standard deviations, depending on the type of variable being examined. Simple two-group comparisons (e.g., comparing women and men) will be analyzed with chi-square tests (e.g., for categorical or dichotomous variables) or independent t-tests (e.g., for ratio, interval, and some ordinal variables). Multi-group comparisons will be made using ANOVA/MANOVA procedures or loglinear analysis procedures; again, depending on the type of variables being examined. Pearson correlations or nonparametric tests of association will be used to examine bivariate co-variation among variables; multiple regression or multiple logistic regression will be used to examine the independent contribution of predictor variables hypothesized to account for variability in health-related or other outcome measures.

Variables: (independent, primary, co-variates)/Questionnaire Items

Demographic-All Questionnaire Versions:

Item Number	Content
2	Gender
3	Age
4	Race/Ethnicity
5	Highest level of education completed
6	Marital status
7	Pay grade
8	Enlisted rating
9	Marine M.O.S.
10	Total # years active duty
11	Total time spent aboard all ships; this ship
12	Where live when ship is in port
13	Current ship/command assigned to
14	Ship's current status (i.e., in port, at sea, etc.)
15	Currently deployed
16	Date began deployment
17	Time/length of deployment
18	# times previously deployed

Lifestyle-All Questionnaire Versions:

Item Number	Content
27	Smoked 100 cigarettes in entire life
28	# days smoked cigarettes last 30 days
29	Average # cigarettes smoked per day during last 30 days
30	Expectations about smoking one year from now
31	Past 30-day exposure to tobacco smoke in immediate work area
32	Past 30-day exposure to tobacco smoke in sleeping or non-work area
33	Sleeping area information
34	Working area information
35	Past 7 days, # days had any alcoholic beverages
36	Past 7 days, usual # alcoholic drinks per day on days drank
37	Past 7 days, largest # alcoholic drinks per day
38	(Unmarried persons only) When ashore, live in a marital-like relationship
39	Height & weight

Health Promotion Services-Questionnaire Version 123 Only:

Item Number	Content
45	Agree-Disagree rating on whether the following Navy health-promotion services were readily available during past 30 days: a Adequate exercise space b Adequate exercise time c Birth control supplies (such as condoms)
46	Agree-Disagree rating on whether the following counseling services were readily available during the past 30 days: a Alcohol abuse b Birth control methods c Drug abuse d Family planning e Medical concerns f Quitting smoking g Stress management h Weight control

Exercise-Questionnaire Version 123 Only:

Item Number	Content
47	In average week, # days engage in exercise/sports for at least 20 min (etc.)
48	In average week, # days engage in hard work (etc.) For at least 20 min

Weight Change and Sleep-Questionnaire Version 123 Only:

Item Number	Content
49	During past 30 days, have you gained weight, lost weight, stayed the same
50	During past 30 days, average # hours of sleep per 24-hour period

LITERATURE REVIEW:

Health promotion has been an important priority area for the U.S. military since the early 1980's. The Department of Defense (DoD) specifically identified health promotion efforts as a way to enhance military readiness and the quality of life of DoD personnel (DoD Directive 1010.10, 1986). Within the Department of the Navy (DoN), vigorous health promotion efforts have emphasized the need for healthful life styles and reduction of health risk factors. These efforts began in the early 1980's when the Office of the Chief of Naval Operations promulgated OPNAVINST 6110.1B (and subsequently OPNAVINST 6110.1C and .1D), creating the Navy's Health and Physical Readiness (HAPR) program. This program established minimum standards for physical fitness and weight control and emphasized the need for all Navy personnel to participate in lifestyle behaviors which promote good health. Several areas related to primary health promotion efforts defined as concerns by the Navy (SECNAVINST 6110.5, 1986 and OPNAVINST 6100.2, 1992) are examined in this study of shipboard women, and include: (a) tobacco prevention and cessation; (b) physical activity and fitness; © weight control; (d) stress management; and (3) alcohol and drug abuse prevention.

Paralleling the prevention focus for our nation's health as set forth in *Healthy People 2000*, the U.S. military also has recognized the importance of primary prevention. By promoting healthful lifestyle behaviors, substantial reductions in morbidity and mortality associated with preventable illnesses and injuries can be achieved, along with enhancements in quality of life and reductions in job-related productivity losses. The U.S. military's strong emphasis on achievement and maintenance of high levels of physical fitness is a good example of promoting healthful lifestyle behaviors (i.e., fitness-enhancing activities) that can have a positive impact on job performance, including physical fitness performance (Conway & Cronan, 1992), perceived quality of life (Woodruff & Conway, 1992a,b; 1990), and long-term health (cf., *Healthy People 2000*). The military also has recognized and taken strong action to deal with unhealthful, high-risk behaviors such as use of illegal drugs, alcohol abuse, and high rates of tobacco use (e.g., OPNAVINST 6100.2, 1992; DoD INSTRUCTION 1010.15, 1994).

Substantial progress has, in fact, been made in several areas. For example, in 1988 under five percent of personnel reported use of illegal drugs, and both alcohol and tobacco use declined over the decade of the 1980's (Bray, et al., 1988). However, military personnel are still more likely than their civilian counterparts to engage in lifestyle behaviors that place them at higher risk for health problems, as well as both intentional and unintentional injuries—namely, higher alcohol and tobacco use (Bray, et al., 1991). Although military women in general tend to engage in better health practices than men (cf., Conway, et al., 1989), the higher usage rates for tobacco and alcohol among military members compared to their civilian counterparts are evident among women as well as among men (Bray, et al., 1991). Furthermore, in Navy personnel these high risk behaviors may be more prevalent among those assigned to ships than to other duty stations. For example, previous research conducted by Conway, et al. (1989) indicated that personnel stationed aboard ships tended to engage in poorer health behaviors than shore-based personnel; however analyses were not conducted to assess the effects of potential co-variates (e.g., age, education) or to examine gender-related differences among shipboard personnel. The current study of shipboard personnel will provide a unique opportunity to extend previous research and provide current information related to both health-promoting and health-detrimental lifestyle behaviors among Navy shipboard women and men.

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APPENDIX C

Health Data Collection Instruments

C.1 Survey Topic Distribution Table

C.2 Survey 123

C.3 Survey 456

C.4 Survey 78

C.5 Survey 90

C.6 Anonymous Questionnaire

C.7 Supplemental Survey

C.8 Sick Call Log

APPENDIX C.1

Survey Topic Distribution Table

U.S. Navy Shipboard Health Survey

	Questionnaire Form			
Dimension	123	456	78	90
Demographics	X	X	X	X
Health conditions	X	X	X	X
Medical history	X	X	X	X
Recent medical care	X	X	X	X
Occupational exposures	X	X	X	X
Protective gear	X	X	X	X
Lifestyle	X			
Medical care satisfaction aboard ship	X			
Medical care use off-ship	X			
Medical care avoidance	X			
Medical visits (medical care use)	X			
Health promotion services	X			
Aerobic exercise and work	X			
Weight change and sleep	X			
Health benefits	X	X		
Quality of life		X	X	
Mood (CES-D) (depression scale)		X	X	
Stress (Martin)		X	X	
Family composition		X	X	
Family and friends (social network scale)		X	X	
Sources of help		X	X	
Brief symptom inventory			X	
Military history			X	
Casualty events		X	X	
Health care (Merrill)				X
Mood assessment I (Merrill)				X
Mood assessment II (Merrill)				X
Mood assessment III (Merrill)				X
Your health I (Merrill)				X
Your health II (Merrill)				X
Your health III (Merrill)				X

Patient satisfaction I (Merrill)				X
Patient satisfaction II (Merrill)				X
Patient satisfaction III (Merrill)				X
Women's health conditions	X	X	X	X
Pregnancy history	X	X	X	X
OB/GYN availability	X	X	X	X
Pre-deployment OB/GYN/visit	X	X	X	X

APPENDIX C.2

Survey 123

U.S. Navy Shipboard Health Survey

Naval Health Research Center, San Diego

Information to participants

You are being asked to voluntarily complete this survey giving candid responses and opinions about health-related issues and to become part of a study that will involve one or more additional questionnaires. Your answers are for research use only and will be kept strictly confidential. Data will be reported so that no individual participant can be identified and the information you provide will not become part of anyone's official records. If you have any questions about this survey, please contact Dr. Frank C. Garland, Naval Health Research Center, San Diego, CA 92186-5122/DSN: 553-6881; Commercial (619) 553-6881.

Privacy Act Statement

1. Authority. 5 USC 301, 10 USC 1071. OPNAV Control Symbol 6000-13C **2. Purpose.** Medical research information will be collected to enhance basic medical knowledge concerning medical care and health promotion. **3. Routine use.** Medical research information will be used in statistical analyses by the Departments of the Navy, Defense, and other U.S. Government agencies, provided this is compatible with the purpose for which information was collected. Use of the information may be granted to non-Government agencies by the Chief, Bureau of Medicine and Surgery, in accordance with the provisions of the Freedom of Information Act. **4. Voluntary disclosure.** I understand that all information derived from the study will be retained at the Naval Health Research Center, San Diego, and that my anonymity will be maintained. I voluntarily agree to its disclosure to agencies or individuals identified in the preceding paragraph, and I have been informed that failure to agree to its disclosure to agencies or individuals identified in the preceding paragraph. I understand that my provision of information is voluntary, and that I am free to discontinue filling out the questionnaire and withdraw from the study at any time without prejudice or loss of medical treatment or privileges to which I would otherwise be entitled.

A. Name (please print):

Last First Middle Initial

B. Social security number: ___ ___ ___ -- ___ ___ -- ___ ___ ___ ___

C. Date of birth: Month: ___ ___ Day: ___ ___ Year: 19 ___ ___

Shipboard Form 123 Questionnaire
THIS PAGE IS TO BE COMPLETED BY ALL STUDY PARTICIPANTS AND WILL BE REMOVED BEFORE PROCESSING.
Note: Questionnaires may be distributed by active-duty, reserve, or civilian personnel.
Rev. 7.0 (31 May 95)

Voluntary Consent to Participate in the U.S. Navy Shipboard Health Survey

1. I am being asked to volunteer to participate in a research study titled, "Health Aboard Navy Ships: A Comprehensive Health and Readiness Research Project" The purpose of this study is to enhance basic medical knowledge concerning the provision of medical care and health promotion. I am being asked to participate now, and can expect to receive a follow-up questionnaire in about 1 year if I am still on active duty.

2. I understand that my participation in this study is completely voluntary. If I do not choose to participate there are no penalties, and I will not lose any benefits to which I am otherwise entitled. I may discontinue my participation in this study at any time I choose without fear of penalty or loss of benefits to which I am otherwise entitled.

3. The benefit that I may expect from my participation in this research study is the knowledge that I will be helping the Navy to provide the best possible medical services to men and women serving aboard Navy ships. There is no direct personal benefit to me from participation in this research study.

4. The investigators believe that there are no direct physical or psychological risks to me as a participant in this research study, with the possible exception of a very unlikely accidental breach of confidentiality and loss of anonymity. Specific measures to ensure my anonymity are outlined in paragraph 5.

5. Confidentiality during this research study will be ensured by restricting access to all data collected to personnel working on this research study who have taken an oath of confidentiality. The confidentiality of the information related to my participation in this research study will be ensured at all times by use of an arbitrary number to identify me. I also understand that none of my responses will become a part of my medical or military record and that no information that might identify me personally will be included in results from reports of this study. Thank you! the anonymous portion of this contains no personal identifiers and cannot be linked to me in any way.

6. If I have questions about this research study I should contact the principal investigator, Dr. Frank C. Garland at the Naval Health Research Center (NHRC), San Diego, CA 92186-5122, phone (619) 553-6881; DSN 553-6881. If I have questions about the ethical aspects of this study, my rights as a volunteer, or any concerns relating to protection of research volunteers, I can contact Dr. Tamsin Kelly at NHRC, phone (619) 553-8443; DSN 553-8443. Additionally, I may contact Dr. Lisa Meyer at NHRC if I have any questions about medical aspects of this study. Dr. Meyer may be contacted at NHRC, phone (619) 553-8376; DSN: 553-8376.

7. I have been informed that Dr. Frank C. Garland is responsible for the storage of my consent form and the research records related to my participation in this study. These records are stored at the Naval Health Research Center, San Diego, CA 92186-5122.

8. I have been given an opportunity to ask questions about this study and its related procedures and risks, as well as any of the other information contained in this consent form. All my questions have been answered to my satisfaction. By my signature below, I give my voluntary informed consent to participate in this research study as it has been explained to me and acknowledge receipt of a copy of this form for my own personal records.

_____
(Last name, first name, middle initial)

_____ _____
(Signature) Date (DD/MM/YY)

--This page will be removed and stored separately to protect your confidentiality--

DEMOGRAPHIC DATA

1. Today's date: Month: ____ ____ Day: ____ ____ Year: 199 ___

2. What is your gender?

   1 ☐ Male
   2 ☐ Female

3. What is your age in years? ____ ____ years

4. What is your race?
   (Check one box)

   1 ☐ White, non-Hispanic
   2 ☐ White, Hispanic
   3 ☐ Black/African-American, non-Hispanic
   4 ☐ Black/African-American, Hispanic
   5 ☐ Asian/Pacific Islander
   6 ☐ Native American
   9 ☐ Other *(Please specify):*_____

5. What is the highest level of education you have completed?
   (Check one box)

   1 ☐ Some high school
   2 ☐ Graduate equivalency degree (GED)
   3 ☐ High school graduate
   4 ☐ Trade or technical school graduate
   5 ☐ Some college or AA degree
   6 ☐ 4-year college degree
   7 ☐ Graduate or professional degree

6. Marital status
   a. What is your current marital status?
   (Check one box)

   1 ☐ Never married
   2 ☐ Married *(Please skip to question 7)*
   3 ☐ Separated
   4 ☐ Divorced
   5 ☐ Widowed

   b. Do you plan to marry during the **next 12 months**?
   (Check one box)

   1 ☐ No
   2 ☐ Yes
   3 ☐ Don't know

7. What is your paygrade? *(Circle one)*

Enlisted		Warrant officer	Officer	
E-1	E-6	W-1	O-1	O-6
E-2	E-7	W-2	O-2	
E-3	E-8	W-3	O-3	
E-4	E-9	W-4	O-4	
E-5			O-5	

8. If you are Navy enlisted, what is your rating (e.g., SN, FN, BT, HM, ASM)? ___ ___ ___

9. If you are Marine enlisted, what is your M.O.S. number? ____ ____ ____ ____

10. What is your total number of years on active duty? ____ ____ years

11. Times aboard ship(s)

    a. What is the approximate total time you have served aboard ship counting all time on **all** ships on which you have served?
    _____ _____ years and _____ _____ months

    b. What is the approximate total time time you served aboard this ship?
    _____ _____ years and _____ _____ months

12. Where do you live when your ship is in your home port?
(Check one box)

    1 ☐ Aboard ship
    2 ☐ Navy Housing
    3 ☐ BEQ/BOQ
    9 ☐ Other

13. To what ship (or command) are you currently assigned? _____

14. If you are currently aboard ship, what is your ship's current status?
*(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")*
(Check one box)

    1 ☐ In home port
    2 ☐ At sea
    3 ☐ In port other than home port
    4 ☐ In shipyard
    9 ☐ Other *(Please specify):*_____

15. Are you currently deployed (**30 days or more**)?
(Check one box)

    1 ☐ No *(Please skip to question 18)*
    2 ☐ Yes

16. What date did you begin this deployment? Mo.:____ ____ Day: ____ ____ Year: 199___

17. If you are out of your home port, what is the expected length of time between today and the date you return to your home port?
(Check one box)

1 ☐ Less than 1 week
2 ☐ 1 week to less than 1 month
3 ☐ 1 month to less than 3 months
4 ☐ 3 months to less than 6 months
5 ☐ 6 months to less than 12 months
6 ☐ 12 months to less than 18 months
7 ☐ 18 months or longer

18. How many times have you deployed aboard Navy ships (**30 days or more**), not counting present deployment? *(Check one box)*

0 ☐ Never ☐ ____ ____ times

HEALTH CONDITIONS

This section is to report all conditions that you had during the **past 30 days** regardless of **whether or not** they resulted in a visit to sick call or a health care provider.

19. Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

a.	1☐ No	2☐ Yes	Common cold symptoms
b.	1☐ No	2☐ Yes	Dizziness
c.	1☐ No	2☐ Yes	Chills
d.	1☐ No	2☐ Yes	Cough
e.	1☐ No	2☐ Yes	Sore throat
f.	1☐ No	2☐ Yes	Fever
g.	1☐ No	2☐ Yes	Flu
h.	1☐ No	2☐ Yes	Diarrhea lasting **at least 3 days**
i.	1☐ No	2☐ Yes	Stomach problems
j.	1☐ No	2☐ Yes	Constipation
k.	1☐ No	2☐ Yes	Indigestion
l.	1☐ No	2☐ Yes	Nausea/vomiting
m.	1☐ No	2☐ Yes	Sinus trouble
n.	1☐ No	2☐ Yes	Hay fever
o.	1☐ No	2☐ Yes	Shortness of breath
p.	1☐ No	2☐ Yes	Hoarseness
q.	1☐ No	2☐ Yes	Skin problems
r.	1☐ No	2☐ Yes	Muscle sprain or strain
s.	1☐ No	2☐ Yes	Back problems
t.	1☐ No	2☐ Yes	Hearing problems
u.	1☐ No	2☐ Yes	Irritated eyes
v.	1☐ No	2☐ Yes	Trouble seeing with one or both eyes even if wearing glasses or contacts

19. — *Continued*— Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

w. 1☐ No 2☐ Yes Pain in stomach or abdominal area
x. 1☐ No 2☐ Yes Heat stress or heat stroke
y. 1☐ No 2☐ Yes Headache:
If yes, was it accompanied by: *(Please check either "no" or "yes" for every condition)*
1☐ No 2☐ Yes Visual disturbances
1☐ No 2☐ Yes Numbness or tingling
1☐ No 2☐ Yes Sensitivity to noise
1☐ No 2☐ Yes Sensitivity to light
1☐ No 2☐ Yes Nausea
z. 1☐ No 2☐ Yes Psychological condition(s) or personal problem(s) severe enough to interfere with daily activities
aa. 1☐ No 2☐ Yes Other condition or injury
Please specify : _____
bb. 1☐ No 2☐ Yes *(Women)* Menstrual conditions (premenstrual syndrome, menstrual cramps, irregular or absent periods)

20. During the **past 30 days:**

a. Did you receive a doctor's diagnosis of any of these from a health care provider not on this ship ?
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Cold or acute nasopharyngitis
2. 1☐ No 2☐ Yes Sore throat, viral
3. 1☐ No 2☐ Yes Cough, viral
4. 1☐ No 2☐ Yes Flu

b. Have you been unable to perform your military duties for 1 or more days because of the reasons below?
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Health problem
2. 1☐ No 2☐ Yes Emotional problem
3. 1☐ No 2☐ Yes Personal problem
4. 1☐ No 2☐ Yes Family problem
5 1☐ No 2☐ Yes Other *(Please specify :)* _____

_____

_____

MEDICAL HISTORY

21. Has a doctor *ever* told you that you had any of the following? *(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)*	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Asthma	❒	❒	____ ____
b. Migraine headache	❒	❒	____ ____
c. Anemia	❒	❒	____ ____
d. Depression	❒	❒	____ ____
e. Gonorrhea	❒	❒	____ ____
f. Syphilis	❒	❒	____ ____
g. Chlamydia	❒	❒	____ ____
h. Urinary tract infection	❒	❒	____ ____
i. Kidney infection	❒	❒	____ ____
j. Hernia (other than hiatal)	❒	❒	____ ____

RECENT MEDICAL CARE

22. Approximately how many months or days ago was your: *(Fill in number of months or days for each item)*	Number of months	Number of days *(if less than 1 month)*
a. Most recent visit to a medical doctor?	____ ____	____ ____
b. Most recent visit to another health care professional? *(Please specify type of provider, e.g., psychologist, dentist, nurse-practitioner)*:	____ ____	____ ____
c. Most recent visit to a hospital corpsman?	____ ____	____ ____

23. If you are currently deployed (**30 days or more**), were you medically screened preceding this deployment?
(Check one box)

1 ❒ No
2 ❒ Yes
9 ❒ Not applicable, since I am not currently deployed.

24. In what month and year were you last screened? Month: _____ _____ Year: 199 ____

OCCUPATIONAL EXPOSURES

25. Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	Past 30 days: No. of days exposed per week	Past 36 months: No. of days exposed per week	Past 36 months: Total no. of mos. exposed
a. Adhesives or gluing compounds	☐	☐	☐				
b. Asbestos (loose)	☐	☐	☐				
c. Carbon monoxide	☐	☐	☐				
d. Diesel exhaust within 50 feet	☐	☐	☐				
e. Diesel fuel within 50 feet	☐	☐	☐				
f. Dry cleaning solvent	☐	☐	☐				
g. Exhaust from gasoline engine	☐	☐	☐				
h. Gasoline (liquid or vapor)	☐	☐	☐				
i. Guided missile fuel	☐	☐	☐				
j. High temperature (above 95°F)	☐	☐	☐				
k. Hypodermic needles (used)	☐	☐	☐				
l. Insecticides	☐	☐	☐				
m. Jet exhaust within 50 feet	☐	☐	☐				
n. Jet fuel within 50 feet	☐	☐	☐				
o. Lifting 25 - 49 pounds	☐	☐	☐				
p. Lifting 50 or more pounds	☐	☐	☐				
q. Loud noise (such as jets)	☐	☐	☐				
r. Low temperature (below 32° F)	☐	☐	☐				
s. Metal scrapings or filings	☐	☐	☐				
t. Microwave oven within 3 feet	☐	☐	☐				
u. Paint (oil based), or thinner	☐	☐	☐				
v. Paint, other or unknown type	☐	☐	☐				
w. Paint scrapings or paint sanding	☐	☐	☐				
x. Radar antenna or array within 50 feet	☐	☐	☐				
y. Solvent or degreaser	☐	☐	☐				
z. Torpedo fuel	☐	☐	☐				

25. —*Continued*—Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	If yes: During the Past 30 days: No. of days exposed per week	If yes: During the Past 36 months: No. of days exposed per week	If yes: During the Past 36 months: Total no. of mos. exposed
aa. Other chemicals *(Please specify):*	☐	☐	☐				
bb. Transmitting antennas within 50 feet	☐	☐	☐				
cc. Nuclear reactor within 50 feet	☐	☐	☐				
dd. Nuclear fuel within 50 feet	☐	☐	☐				
ee. Nuclear ordnance within 50 feet	☐	☐	☐				
ff. Nuclear medicines (radioisotopes)	☐	☐	☐				
gg. Video display terminal (VDT, CRT)	☐	☐	☐				
hh. Welding fumes	☐	☐	☐				
ii. Dust or particles	☐	☐	☐				
jj. Explosives (nonnuclear) within 50 feet	☐	☐	☐				
kk. Nitrous oxide	☐	☐	☐				
ll. Ethylene dibromide (EDB)	☐	☐	☐				
mm. Perchlorethylene (PERC)	☐	☐	☐				
nn. Anthrax vaccine	☐	☐	☐	Year first received 19 ___ ___		Year last received 19 ___ ___	
oo. Antimalaria pills	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
pp. Pyridostigmine	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
qq. Other anti-CBW pills or agents *(Please specify):*	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	

PROTECTIVE GEAR

26. Is protective gear available for use in your current job?
(Please check one box in each of the four columns)

Item	Is this item available?			Does it fit you properly?			Do you wear it when needed?			Does it seriously interfere with your ability to do your work?		
	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)
a. Gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b. Respirator or mask	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c. Protective gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d. Boots	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e. Ear plugs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f. Film badges	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g. Hazardous materials suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h. Fire fighting suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

LIFESTYLE

27. Have you smoked at least 100 cigarettes in **your entire life**? *(Check one box)*

1 ☐ No *(Please skip to question 30)*
2 ☐ Yes

28. On how many of the **past 30 days** did you smoke cigarettes? *(Check one box)*

0 ☐ None
1 ☐ 1-4 days
2 ☐ 5-9 days
3 ☐ 10-14 days
4 ☐ 15-19 days
5 ☐ 20-24 days
6 ☐ 25-29 days
7 ☐ Every day
9 ☐ Not sure

29. On average, about how many cigarettes did you smoke per day during the **past 30 days**? *(Check one box)*

0 ☐ None
1 ☐ Fewer than 1 cigarette a day, on the average
2 ☐ 1-4 cigarettes
3 ☐ 5-9 cigarettes
4 ☐ 10-19 cigarettes
5 ☐ 20-29 cigarettes
6 ☐ 30-39 cigarettes
7 ☐ 40-49 cigarettes
8 ☐ 50 or more cigarettes
9 ☐ Not sure

30. **1 year from now**, how do you see yourself with regard to cigarette smoking? *(Check one box)*

1 ☐ Definitely a non-smoker
2 ☐ Probably a non-smoker
3 ☐ Maybe a smoker, maybe not
4 ☐ Probably a smoker
5 ☐ Definitely a smoker

31. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your immediate work area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

32. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your sleeping area or other non-working area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

33. Sleeping area

a. Approximately how many people occupy your sleeping quarters aboard ship when you are sleeping (not counting yourself)?

_____ _____ _____ people

b. Where is your bunk/bed?

Deck or floor designation: _____

Room or compartment number: _____

34. Working area

a. Approximately how many people occupy your work area when you are working?

_____ _____ _____ people

b. Where is your work area?

Deck or floor designation: _____

Room or compartment number: _____

Multiple areas *(Please specify areas)*: _____

35. During the **past 7 days**, on how many days did you have any alcoholic beverages? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦

(If 0, please skip to question 38)

36. On the days you drank any alcoholic beverage during the **past 7 days**, how many drinks did you usually have per day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no._____ _____

37. During the **past 7 days**,what was the largest number of alcoholic drinks you had in 1 day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no. _____ _____

38. *(Unmarried men and women)* When you are ashore, do you live with a significant other person in a marital-like relationship? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Don't know

39. My current: a. Weight is _____ _____ _____ pounds

b. Height is _____ feet and _____ _____ inches

MEDICAL CARE SATISFACTION ABOARD SHIP

40. If your most recent medical care visit was aboard ship, how satisfied were you with the: *(Check one box on each line)*

	Very satisfied (1)	Satisfied (2)	Neither satisfied nor dissatisfied (3)	Dissatisfied (4)	Very dissatisfied (5)	Not applicable (6)
a. Quality of medical services provided	❒	❒	❒	❒	❒	❒
b. Amount of privacy you had during the visit	❒	❒	❒	❒	❒	❒
c. Amount of time you waited at the facility to see a health-care provider	❒	❒	❒	❒	❒	❒
d. Availability of medications *(Please specify medications that were unavailable)* _____ _____ _____	❒	❒	❒	❒	❒	❒
e. Availability of medical supplies *(Please specify supplies that were unavailable)* _____ _____ _____	❒	❒	❒	❒	❒	❒

MEDICAL CARE USE OFF SHIP

41. I f you obtained medical care from a source other than your ship's medical department, what were the reasons? *(Check as many as apply)*

1 ❒ It was more convenient because the other source of medical care was closer to my home
2 ❒ I needed speciality care that was not available aboard this ship
3 ❒ I had an established medical care relationship with a health-care provider ashore
4 ❒ I preferred to be seen by a health-care provider whom I do not see on a daily basis aboard ship
5 ❒ I needed more privacy than was available in facilities aboard this ship

MEDICAL CARE AVOIDANCE

42. Have you avoided going to the medical department aboard this ship during the **past 30 days** when you felt you needed medical care or advice?

1 ☐ No
2 ☐ Yes (Specify reason(s):

_____

_____)

MEDICAL VISITS

43. During the **past 30 days**, how many times did you visit sick call, a medical doctor or other health care provider to obtain care for yourself? *(Check one box)*

0 ☐ I did not visit sick call or a health-care provider during the **past 30 days**.
(If you checked this box, please skip to question 45)

1 ☐ I visited sick call or a health-care provider(s): ____ ____ time(s) during the **past 30 days**.

44. If you had one or more visits to sick call or a health-care provider during the **past 30 days**, answer items a and b, below.

a. Which of these health-care providers did you visit? *(Check box and write in visits)*

1 ☐ Hospital corpsman . . . . . No. of visits: ① ② ③ ④ ⑤ or more
2 ☐ Medical doctor (MD/DO) . . . . . No. of visits: ① ② ③ ④ ⑤ or more
9 ☐ Other health-care professional
(*Please specify*: _____) No. of visits: ① ② ③ ④ ⑤ or more

b. Where did the visit(s) occur? *(Check box and write in number of visit(s))*

1 ☐ Aboard my ship . . . . . No. of visits: ① ② ③ ④ ⑤ or more
2 ☐ Aboard another ship . . . . . No. of visits: ① ② ③ ④ ⑤ or more
3 ☐ Navy emergency room . . . . . No. of visits: ① ② ③ ④ ⑤ or more
4 ☐ Other military emergency room . . . No. of visits: ① ② ③ ④ ⑤ or more
5 ☐ Navy clinic ashore . . . . . No. of visits: ① ② ③ ④ ⑤ or more
6 ☐ Other military clinic or facility . . . No. of visits: ① ② ③ ④ ⑤ or more
7 ☐ Community hospital emergency room No. of visits: ① ② ③ ④ ⑤ or more
8 ☐ Private M.D. office . . . . . No. of visits: ① ② ③ ④ ⑤ or more
9 ☐ Hospital as an inpatient overnight or longer No. of visits: ① ② ③ ④ ⑤ or more
10 ☐ Other
(*Please specify*: _____) No. of visits: ① ② ③ ④ ⑤ or more

HEALTH PROMOTION SERVICES

Please rate your agreement or disagreement with the following statements concerning the availability to you of Navy health-promotion services.

45. During the **past 30 days** the following were readily available to me: *(Check one box on each line)*	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	Not applicable (5)
a. Adequate exercise space	☐	☐	☐	☐	☐	☐
b. Adequate exercise time	☐	☐	☐	☐	☐	☐
c. Birth control supplies (such as condoms)	☐	☐	☐	☐	☐	☐

46. During the **past 30 days** I felt counseling was readily available to me on: *(Check one box on each line)*	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	Not applicable (5)
a. Alcohol abuse	☐	☐	☐	☐	☐	☐
b. Birth control methods	☐	☐	☐	☐	☐	☐
c. Drug abuse	☐	☐	☐	☐	☐	☐
d. Family planning	☐	☐	☐	☐	☐	☐
e. Medical concerns	☐	☐	☐	☐	☐	☐
f. Quitting smoking	☐	☐	☐	☐	☐	☐
g. Stress management	☐	☐	☐	☐	☐	☐
d. Weight control	☐	☐	☐	☐	☐	☐

AEROBIC EXERCISE AND WORK

47. In an **average 7 days**, on how many days do you engage in exercise or sports that lasts at least 20 minutes without stopping, and that is hard enough to make you breathe heavier and your heart beat faster?:
*(Fill in **one** circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ days

48. In an **average 7 days**, on how many days do you engage in work that is hard enough to make you breathe heavier and your heart beat faster that lasts at least 20 minutes without stopping?:
*(Fill in **one** circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ days

WEIGHT CHANGE AND SLEEP

49. During the **past 30 days** have you:
(Check one box)

1 ❒ Gained weight, pounds_____
2 ❒ Lost weight, pounds _____
3 ❒ Stayed the same

50. During the **past 30 days**, on the average, how many hours of sleep did you get **per 24 hours**?
(Fill in one circle)

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ hours

HEALTH BELIEFS

51. Questions about your health beliefs a. The following items are about your health beliefs. *(Check one box on each line)*	Not at all (1)	Somewhat (2)	Frequently (3)	Very much so (4)
a. How often do you think about your health?	☐	☐	☐	☐
b. How concerned are you about your health?	☐	☐	☐	☐
c. How important do you think it is that people take special care of their health?	☐	☐	☐	☐
d. How likely is it that you will try to do a better job of taking care of your health in the future?	☐	☐	☐	☐
e. Compared to other people of your age, would you say you get ill much more often?	☐	☐	☐	☐
f. Compared to other people of your age, when you do get ill would you say you get ill much more often?	☐	☐	☐	☐
g. I seem to resist illness better than other people.	☐	☐	☐	☐
h. In general, when you get ill, how much does it interfere with your usual activities?	☐	☐	☐	☐
i. When I'm ill I try to keep going on as usual.	☐	☐	☐	☐
j. When I'm ill I cut back on whatever I'm doing in order to get well.	☐	☐	☐	☐

51. b. How likely do you feel, it is that you will develop any of the following problems in the **next 12 months**? *(Check one box on each line)*	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
a. Weight problems	☐	☐	☐	☐
b. High blood pressure	☐	☐	☐	☐
c. Cancer	☐	☐	☐	☐
d. Heart disease	☐	☐	☐	☐
e. Stroke	☐	☐	☐	☐
f. Heart attack	☐	☐	☐	☐

51. c. How serious a health problem do you think the following would be if you were to develop them? *(Check one box on each line)*	Not at all severe (1)	Not severe (2)	Severe (3)	Very severe (4)
a. Weight problems	☐	☐	☐	☐
b. High blood pressure	☐	☐	☐	☐
c. Cancer	☐	☐	☐	☐
d. Heart disease	☐	☐	☐	☐
e. Stroke	☐	☐	☐	☐
f. Heart attack	☐	☐	☐	☐

51. d. Use this scale to answer the question: *(Check one box)*	Not at all effective (1)	Not effective (2)	Effective (3)	Very effective (4)
How effective do you think health screening is in reducing your chances of getting a serious illness?	☐	☐	☐	☐

51. e. Which of the following reasons would stop you from going to sick call? *(Check one box on each line)*	Very untrue (1)	Untrue (2)	True (3)	Very true (4)
a. It would take up a lot of my spare time.	☐	☐	☐	☐
b. I would have problems getting to an appointment.	☐	☐	☐	☐
c. It would be too much effort.	☐	☐	☐	☐
d. I have other more important things to do.	☐	☐	☐	☐
e. I'm uninterested.	☐	☐	☐	☐
f. I'm too lazy.	☐	☐	☐	☐
g. I might be "told off".	☐	☐	☐	☐
h. I already feel healthy.	☐	☐	☐	☐
i. I don't know enough about it.	☐	☐	☐	☐
j. I'm already seeing the doctor a lot.	☐	☐	☐	☐
k. Fear of the results of screening -- of what they might find.	☐	☐	☐	☐
l. It would be embarrassing.	☐	☐	☐	☐
m. Would you be worried about any aspects of a screening appointment?	☐	☐	☐	☐

WOMEN'S SECTION

HEALTH CONDITIONS (WOMEN)

52. Reproductive system health

Condition	a. Did you have this condition in the **past 90 days?** *(Check one box on each line)*			b. If yes, did you first notice the condition, or did it get worse, **since you came aboard this ship?** *(Check one box on each line if answer to the condition is "yes")*		
	No (1)	Yes (2)	Not sure (9)	First noticed (1)	Got worse (2)	Not sure (9)
a. Bleeding between periods	☐	☐	☐	☐	☐	☐
b. Cramps or pain during menstrual period requiring medication or time off work	☐	☐	☐	☐	☐	☐
c. Excessive frequency of periods (time between periods too short)	☐	☐	☐	☐	☐	☐
d. Heavy periods (excessive menstrual flow)	☐	☐	☐	☐	☐	☐
e. Period lasting longer than 1 week	☐	☐	☐	☐	☐	☐
f. Scanty menstrual flow	☐	☐	☐	☐	☐	☐
g. Abdominal pain (from known cysts)	☐	☐	☐	☐	☐	☐
h. Abdominal pain (from known endometriosis)	☐	☐	☐	☐	☐	☐
i. Abdominal pain (from other or unknown cause) *(Specify:)*	☐	☐	☐	☐	☐	☐
j. Discharge from breast	☐	☐	☐	☐	☐	☐
k. Breast lump	☐	☐	☐	☐	☐	☐
l. Other symptoms related to menstrual period *(Specify:)*	☐	☐	☐	☐	☐	☐

53. Did any of the conditions listed above (a through l) require you to:

a. Take 2 or more hours off from work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

54. During the **past 12 months** have you had regular menstrual periods?
(Check one box)

1 ☐ No
(Please explain:_____

_____

2 ☐ Yes, about 1 per month.
3 ☐ Yes, but not 1 per month.
(Please explain:_____

_____

If you missed one or more periods during the past 12 months, please check one box below:

1 ☐ I missed my period approximately ____ ____ time(s) during the **past 12 months.**
0 ☐ I had no periods at all during the **past 12 months.**
9 ☐ I'm not sure of the number of periods I missed during the **past 12 months.**

55. During the **past 90 days** have you taken birth control pills <u>to regulate your period</u>?
(Check one box)

1 ☐ No 2 ☐ Yes

56. During the **past 90 days** have you taken replacement estrogens?
(Check one box)

1 ☐ No
2 ☐ Yes, hormone pills
3 ☐ Yes, hormone creams or other hormone preparations

57. Did you have any of these during **past 90 days**?
(Please check either "no" or "yes" for every condition listed)

a. 1 ☐ No 2 ☐ Yes Urinary tract infection
b. 1 ☐ No 2 ☐ Yes Vaginal rash, discharge, or other vaginal disorder except yeast infection, not including sexually transmitted diseases
c. 1 ☐ No 2 ☐ Yes Yeast infection
d. 1 ☐ No 2 ☐ Yes Pelvic or lower abdominal pain
e. 1 ☐ No 2 ☐ Yes Gonorrhea
f. 1 ☐ No 2 ☐ Yes Other sexually-transmitted disease
g. 1 ☐ No 2 ☐ Yes Other genitourinary system condition
*(Please specify):*_____

58. Did any of the conditions listed above (a through g) require you to:

a. Take 2 or more hours off from work during the **past 90 days**?
(Check one box)

1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**?
(Check one box)
1 ☐ No 2 ☐ Yes

59. During the past 12 months have you usually had regular menstrual periods?
(Check one box)

1 ☐ No *(Please specify):*_____
2 ☐ Yes, about one per month
3 ☐ Yes, but not one per month

60. Has a doctor *ever* told you that you had any of the following? *(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)*	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Abnormal Pap smear (test for cervical cancer)	☐	☐	____ ____
b. Breast lump diagnosed as benign breast cyst or fibrocystic disease *(Please specify):*	☐	☐	____ ____
c. Benign breast lump, exact diagnosis unknown	☐	☐	____ ____
d. Breast cancer	☐	☐	____ ____

PREGNANCY HISTORY

61. How many times have you been pregnant?
(Check one box)

0 ☐ Never *(Please skip to question 65)*
1 ☐ I have been pregnant _____ _____ times.

62. Have you been pregnant during the **past 12 months**?
(Check one box)

1 ☐ No
2 ☐ Yes

63. Are you pregnant now?
(Check one box)

1 ☐ No
2 ☐ Yes
3 ☐ Not sure

64. How many babies (live births) have you had?
(Fill in one circle)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ or more

65. What is your best estimate of the likelihood that you will become pregnant in the **next 12 months**?

*(Fill in a number between 0 and 100, with 0 representing **no chance** that the event will occur, and 100 representing that the event **definitely** will occur):*

_____ _____ _____ percent

66. Please provide the following information in chronological order. For multiple outcomes, make each a separate entry (e.g., two entries for twins). Indicate only one "outcome" per pregnancy. If you are uncertain of a detail, provide your best estimate.

Pregnancy

	Outcome	What was the approximate date of this outcome?	Were you in the Navy at the time?	What was your duty station type at the time of: Conception	What was your duty station type at the time of: Outcome	Was this pregnancy planned?
a. Most recent	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
b. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
c. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
d. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
e. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No

OB/GYN AVAILABILITY

67. During the **past 30 days** the following were readily available to me from this ship's medical department, if I needed them:
(Check one box on each line)

	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	I did not need this item (9)
a. Birth control pills	❐	❐	❐	❐	❐	❐
b. Depo-Provera, Norplant	❐	❐	❐	❐	❐	❐
c. Condoms	❐	❐	❐	❐	❐	❐
d. Diaphragm	❐	❐	❐	❐	❐	❐
e. Pregnancy testing or test kit	❐	❐	❐	❐	❐	❐
f. Family planning information	❐	❐	❐	❐	❐	❐
g. Appropriately staffed and equipped OB/GYN medical support	❐	❐	❐	❐	❐	❐

68. Approximately how many months or days ago was your most recent:
(Fill in number of months or days for each item)

	Number of months	**Number of days** *(if less than 1 month)*
a. Pap smear (test for cervical cancer)?	____ ____	____ ____
d. Pelvic examination?	____ ____	____ ____
e. Breast examination by a physician or nurse	____ ____	____ ____

OB/GYN QUESTIONS FOR CURRENTLY DEPLOYED WOMEN

69. Did you request a pre-deployment appointment with a gynecologist or obstetrician from a Navy medical facility prior to this deployment?? *(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")*
(Check one box)

1 ❐ No *(Please skip to Comments and Suggestions on the last page)*
2 ❐ Yes

70. Were you given a gynecological or obstetrical appointment? *(Check one box)*

1 ❐ No *(Please skip to Comments and Suggestions on the last page)*
2 ❐ Yes

a. Did you keep the appointment? *(Check one box)*

1 ❐ No
2 ❐ Yes

ADDITIONAL COMMENTS AND SUGGESTIONS

Additional comments you would like to add:

Suggestions for topics that should be added, changed, or deleted:

THANK YOU!

Please return to your shipboard coordinator or:

Naval Health Research Center
Code 233
P.O. Box 85122
San Diego CA 92186-5122
Telephone (619) 553-6881; DSN 553-6881

APPENDIX C.3

Survey 456

U.S. Navy Shipboard Health Survey

Naval Health Research Center, San Diego

Information to participants

You are being asked to voluntarily complete this survey giving candid responses and opinions about health-related issues and to become part of a study that will involve one or more additional questionnaires. Your answers are for research use only and will be kept strictly confidential. Data will be reported so that no individual participant can be identified and the information you provide will not become part of anyone's official records. If you have any questions about this survey, please contact Dr. Frank C. Garland, Naval Health Research Center, San Diego, CA 92186-5122/DSN: 553-6881; Commercial (619) 553-6881.

Privacy Act Statement

1. Authority. 5 USC 301, 10 USC 1071. OPNAV Control Symbol 6000-13C. **2. Purpose.** Medical research information will be collected to enhance basic medical knowledge concerning medical care and health promotion. **3. Routine use.** Medical research information will be used in statistical analyses by the Departments of the Navy, Defense, and other U.S. Government agencies, provided this is compatible with the purpose for which information was collected. Use of the information may be granted to non-Government agencies by the Chief, Bureau of Medicine and Surgery, in accordance with the provisions of the Freedom of Information Act. **4. Voluntary disclosure.** I understand that all information derived from the study will be retained at the Naval Health Research Center, San Diego, and that my anonymity will be maintained. I voluntarily agree to its disclosure to agencies or individuals identified in the preceding paragraph, and I have been informed that failure to agree to its disclosure to agencies or individuals identified in the preceding paragraph. I understand that my provision of information is voluntary, and that I am free to discontinue filling out the questionnaire and withdraw from the study at any time without prejudice or loss of medical treatment or privileges to which I would otherwise be entitled.

A. Name (please print):

Last First Middle Initial

B. Social security number: ____ ____ ____ -- ____ ____ -- ____ ____ ____ ____

C. Date of birth: Month: ____ ____ Day: ____ ____ Year: 19 ____ ____

Shipboard Form 456 Questionnaire
THIS PAGE IS TO BE COMPLETED BY ALL STUDY PARTICIPANTS AND WILL BE REMOVED BEFORE PROCESSING.
Note: Questionnaires may be distributed by active-duty, reserve, or civilian personnel.
Rev. 7.0 (31 May 95)

Voluntary Consent to Participate in the U.S. Navy Shipboard Health Survey

1. I am being asked to volunteer to participate in a research study titled, "Health Aboard Navy Ships: A Comprehensive Health and Readiness Research Project" The purpose of this study is to enhance basic medical knowledge concerning the provision of medical care and health promotion. I am being asked to participate now, and can expect to receive a follow-up questionnaire in about 1 year if I am still on active duty.

2. I understand that my participation in this study is completely voluntary. If I do not choose to participate there are no penalties, and I will not lose any benefits to which I am otherwise entitled. I may discontinue my participation in this study at any time I choose without fear of penalty or loss of benefits to which I am otherwise entitled.

3. The benefit that I may expect from my participation in this research study is the knowledge that I will be helping the Navy to provide the best possible medical services to men and women serving aboard Navy ships. There is no direct personal benefit to me from participation in this research study.

4. The investigators believe that there are no direct physical or psychological risks to me as a participant in this research study, with the possible exception of a very unlikely accidental breach of confidentiality and loss of anonymity. Specific measures to ensure my anonymity are outlined in paragraph 5.

5. Confidentiality during this research study will be ensured by restricting access to all data collected to personnel working on this research study who have taken an oath of confidentiality. The confidentiality of the information related to my participation in this research study will be ensured at all times by use of an arbitrary number to identify me. I also understand that none of my responses will become a part of my medical or military record and that no information that might identify me personally will be included in results from reports of this study. Thank you! the anonymous portion of this contains no personal identifiers and cannot be linked to me in any way.

6. If I have questions about this research study I should contact the principal investigator, Dr. Frank C. Garland at the Naval Health Research Center (NHRC), San Diego, CA 92186-5122, phone (619) 553-6881; DSN 553-6881. If I have questions about the ethical aspects of this study, my rights as a volunteer, or any concerns relating to protection of research volunteers, I can contact Dr. Tamsin Kelly at NHRC, phone (619) 553-8443; DSN 553-8443. Additionally, I may contact Dr. Lisa Meyer at NHRC if I have any questions about medical aspects of this study. Dr. Meyer may be contacted at NHRC, phone (619) 553-8376; DSN: 553-8376.

7. I have been informed that Dr. Frank C. Garland is responsible for the storage of my consent form and the research records related to my participation in this study. These records are stored at the Naval Health Research Center, San Diego, CA 92186-5122.

8. I have been given an opportunity to ask questions about this study and its related procedures and risks, as well as any of the other information contained in this consent form. All my questions have been answered to my satisfaction. By my signature below, I give my voluntary informed consent to participate in this research study as it has been explained to me and acknowledge receipt of a copy of this form for my own personal records.

_____
(Last name, first name, middle initial)

_____ _____
(Signature) Date (DD/MM/YY)

--This page will be removed and stored separately to protect your confidentiality--

DEMOGRAPHIC DATA

1. Today's date: Month: ____ ____ Day: ____ ____ Year: 199 ___

2. What is your gender?

   1 ❒ Male
   2 ❒ Female

3. What is your age in years? ____ ____ years

4. What is your race?
   (Check one box)

   1 ❒ White, non-Hispanic
   2 ❒ White, Hispanic
   3 ❒ Black/African-American, non-Hispanic
   4 ❒ Black/African-American, Hispanic
   5 ❒ Asian/Pacific Islander
   6 ❒ Native American
   9 ❒ Other *(Please specify):*_____

5. What is the highest level of education you have completed?
   (Check one box)

   1 ❒ Some high school
   2 ❒ Graduate equivalency degree (GED)
   3 ❒ High school graduate
   4 ❒ Trade or technical school graduate
   5 ❒ Some college or AA degree
   6 ❒ 4-year college degree
   7 ❒ Graduate or professional degree

6. Marital status
   a. What is your current marital status?
   (Check one box)

   1 ❒ Never married
   2 ❒ Married *(Please skip to question 7)*
   3 ❒ Separated
   4 ❒ Divorced
   5 ❒ Widowed

   b. Do you plan to marry during the **next 12 months**?
   (Check one box)

   1 ❒ No
   2 ❒ Yes
   3 ❒ Don't know

7. What is your paygrade? *(Circle one)*

Enlisted		Warrant officer	Officer	
E-1	E-6	W-1	O-1	O-6
E-2	E-7	W-2	O-2	
E-3	E-8	W-3	O-3	
E-4	E-9	W-4	O-4	
E-5			O-5	

8. If you are Navy enlisted, what is your rating (e.g., SN, FN, BT, HM, ASM)? ___ ___ ___

9. If you are Marine enlisted, what is your M.O.S. number? ____ ____ ____ ____

10. What is your total number of years on active duty? ____ ____ years

11. Times aboard ship(s)

    a. What is the approximate total time you have served aboard ship counting all time on **all** ships on which you have served?
    _____ _____ years and _____ _____ months

    b. What is the approximate total time time you served aboard this ship?
    _____ _____ years and _____ _____ months

12. Where do you live when your ship is in your home port?
(Check one box)

    1 ☐ Aboard ship
    2 ☐ Navy Housing
    3 ☐ BEQ/BOQ
    9 ☐ Other

13. To what ship (or command) are you currently assigned? _____

14. If you are currently aboard ship, what is your ship's current status?
*(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")*
(Check one box)

    1 ☐ In home port
    2 ☐ At sea
    3 ☐ In port other than home port
    4 ☐ In shipyard
    9 ☐ Other *(Please specify):*_____

15. Are you currently deployed (**30 days or more**)?
(Check one box)

    1 ☐ No *(Please skip to question 18)*
    2 ☐ Yes

16. What date did you begin this deployment? Mo.:____ ____ Day: ____ ____ Year: 199___

17. If you are out of your home port, what is the expected length of time between today and the date you return to your home port?
(Check one box)

1 ☐ Less than 1 week
2 ☐ 1 week to less than 1 month
3 ☐ 1 month to less than 3 months
4 ☐ 3 months to less than 6 months
5 ☐ 6 months to less than 12 months
6 ☐ 12 months to less than 18 months
7 ☐ 18 months or longer

18. How many times have you deployed aboard Navy ships (**30 days or more**), not counting present deployment? *(Check one box)*

0 ☐ Never ☐ ____ ____ times

HEALTH CONDITIONS

This section is to report all conditions that you had during the **past 30 days** regardless of **whether or not** they resulted in a visit to sick call or a health care provider.

19. Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

a.	1☐ No	2☐ Yes	Common cold symptoms
b.	1☐ No	2☐ Yes	Dizziness
c.	1☐ No	2☐ Yes	Chills
d.	1☐ No	2☐ Yes	Cough
e.	1☐ No	2☐ Yes	Sore throat
f.	1☐ No	2☐ Yes	Fever
g.	1☐ No	2☐ Yes	Flu
h.	1☐ No	2☐ Yes	Diarrhea lasting **at least 3 days**
i.	1☐ No	2☐ Yes	Stomach problems
j.	1☐ No	2☐ Yes	Constipation
k.	1☐ No	2☐ Yes	Indigestion
l.	1☐ No	2☐ Yes	Nausea/vomiting
m.	1☐ No	2☐ Yes	Sinus trouble
n.	1☐ No	2☐ Yes	Hay fever
o.	1☐ No	2☐ Yes	Shortness of breath
p.	1☐ No	2☐ Yes	Hoarseness
q.	1☐ No	2☐ Yes	Skin problems
r.	1☐ No	2☐ Yes	Muscle sprain or strain
s.	1☐ No	2☐ Yes	Back problems
t.	1☐ No	2☐ Yes	Hearing problems
u.	1☐ No	2☐ Yes	Irritated eyes
v.	1☐ No	2☐ Yes	Trouble seeing with one or both eyes even if wearing glasses or contacts

19. — *Continued*— Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

w. 1☐ No 2☐ Yes Pain in stomach or abdominal area
x. 1☐ No 2☐ Yes Heat stress or heat stroke
y. 1☐ No 2☐ Yes Headache:
If yes, was it accompanied by: *(Please check either "no" or "yes" for every condition)*
1☐ No 2☐ Yes Visual disturbances
1☐ No 2☐ Yes Numbness or tingling
1☐ No 2☐ Yes Sensitivity to noise
1☐ No 2☐ Yes Sensitivity to light
1☐ No 2☐ Yes Nausea
z. 1☐ No 2☐ Yes Psychological condition(s) or personal problem(s) severe enough to interfere with daily activities
aa. 1☐ No 2☐ Yes Other condition or injury
Please specify : _____
bb. 1☐ No 2☐ Yes *(Women)* Menstrual conditions (premenstrual syndrome, menstrual cramps, irregular or absent periods)

20. During the **past 30 days:**

a. Did you receive a doctor's diagnosis of any of these from a health care provider not on this ship ?
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Cold or acute nasopharyngitis
2. 1☐ No 2☐ Yes Sore throat, viral
3. 1☐ No 2☐ Yes Cough, viral
4. 1☐ No 2☐ Yes Flu

b. Have you been unable to perform your military duties for 1 or more days because of the reasons below?
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Health problem
2. 1☐ No 2☐ Yes Emotional problem
3. 1☐ No 2☐ Yes Personal problem
4. 1☐ No 2☐ Yes Family problem
5 1☐ No 2☐ Yes Other *(Please specify :)* _____

_____

_____

MEDICAL HISTORY

21. Has a doctor *ever* told you that you had any of the following? *(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)*	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Asthma	☐	☐	____ ____
b. Migraine headache	☐	☐	____ ____
c. Anemia	☐	☐	____ ____
d. Depression	☐	☐	____ ____
e. Gonorrhea	☐	☐	____ ____
f. Syphilis	☐	☐	____ ____
g. Chlamydia	☐	☐	____ ____
h. Urinary tract infection	☐	☐	____ ____
i. Kidney infection	☐	☐	____ ____
j. Hernia (other than hiatal)	☐	☐	____ ____

RECENT MEDICAL CARE

22. Approximately how many months or days ago was your: *(Fill in number of months or days for each item)*	Number of months	Number of days *(if less than 1 month)*
a. Most recent visit to a medical doctor?	____ ____	____ ____
b. Most recent visit to another health care professional? *(Please specify type of provider, e.g., psychologist, dentist, nurse-practitioner)*:	____ ____	____ ____
c. Most recent visit to a hospital corpsman?	____ ____	____ ____

23. If you are currently deployed (**30 days or more**), were you medically screened preceding this deployment?
(Check one box)

1 ☐ No
2 ☐ Yes
9 ☐ Not applicable, since I am not currently deployed.

24. In what month and year were you last screened? Month: _____ _____ Year: 199 ____

OCCUPATIONAL EXPOSURES

25. Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	Past 30 days: No. of days exposed per week	Past 36 months: No. of days exposed per week	Past 36 months: Total no. of mos. exposed
a. Adhesives or gluing compounds	☐	☐	☐				
b. Asbestos (loose)	☐	☐	☐				
c. Carbon monoxide	☐	☐	☐				
d. Diesel exhaust within 50 feet	☐	☐	☐				
e. Diesel fuel within 50 feet	☐	☐	☐				
f. Dry cleaning solvent	☐	☐	☐				
g. Exhaust from gasoline engine	☐	☐	☐				
h. Gasoline (liquid or vapor)	☐	☐	☐				
i. Guided missile fuel	☐	☐	☐				
j. High temperature (above 95°F)	☐	☐	☐				
k. Hypodermic needles (used)	☐	☐	☐				
l. Insecticides	☐	☐	☐				
m. Jet exhaust within 50 feet	☐	☐	☐				
n. Jet fuel within 50 feet	☐	☐	☐				
o. Lifting 25 - 49 pounds	☐	☐	☐				
p. Lifting 50 or more pounds	☐	☐	☐				
q. Loud noise (such as jets)	☐	☐	☐				
r. Low temperature (below 32° F)	☐	☐	☐				
s. Metal scrapings or filings	☐	☐	☐				
t. Microwave oven within 3 feet	☐	☐	☐				
u. Paint (oil based), or thinner	☐	☐	☐				
v. Paint, other or unknown type	☐	☐	☐				
w. Paint scrapings or paint sanding	☐	☐	☐				
x. Radar antenna or array within 50 feet	☐	☐	☐				
y. Solvent or degreaser	☐	☐	☐				
z. Torpedo fuel	☐	☐	☐				

25. —*Continued*—Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	If yes: During the Past 30 days: No. of days exposed per week	If yes: During the Past 36 months: No. of days exposed per week	If yes: During the Past 36 months: Total no. of mos. exposed
aa. Other chemicals *(Please specify):*	❐	❐	❐				
bb. Transmitting antennas within 50 feet	❐	❐	❐				
cc. Nuclear reactor within 50 feet	❐	❐	❐				
dd. Nuclear fuel within 50 feet	❐	❐	❐				
ee. Nuclear ordnance within 50 feet	❐	❐	❐				
ff. Nuclear medicines (radioisotopes)	❐	❐	❐				
gg. Video display terminal (VDT, CRT)	❐	❐	❐				
hh. Welding fumes	❐	❐	❐				
ii. Dust or particles	❐	❐	❐				
jj. Explosives (nonnuclear) within 50 feet	❐	❐	❐				
kk. Nitrous oxide	❐	❐	❐				
ll. Ethylene dibromide (EDB)	❐	❐	❐				
mm. Perchlorethylene (PERC)	❐	❐	❐				
nn. Anthrax vaccine	❐	❐	❐	Year first received 19 ___ ___		Year last received 19 ___ ___	
oo. Antimalaria pills	❐	❐	❐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
pp. Pyridostigmine	❐	❐	❐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
qq. Other anti-CBW pills or agents *(Please specify):*	❐	❐	❐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	

PROTECTIVE GEAR

26. Is protective gear available for use in your current job?
(Please check one box in each of the four columns)

Item	Is this item available?			Does it fit you properly?			Do you wear it when needed?			Does it seriously interfere with your ability to do your work?		
	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)
a. Gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b. Respirator or mask	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c. Protective gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d. Boots	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e. Ear plugs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f. Film badges	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g. Hazardous materials suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h. Fire fighting suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

LIFESTYLE

27. Have you smoked at least 100 cigarettes in **your entire life**? *(Check one box)*

1 ☐ No *(Please skip to question 30)*
2 ☐ Yes

28. On how many of the **past 30 days** did you smoke cigarettes? *(Check one box)*

0 ☐ None
1 ☐ 1-4 days
2 ☐ 5-9 days
3 ☐ 10-14 days
4 ☐ 15-19 days
5 ☐ 20-24 days
6 ☐ 25-29 days
7 ☐ Every day
9 ☐ Not sure

29. On average, about how many cigarettes did you smoke per day during the **past 30 days**? *(Check one box)*

0 ☐ None
1 ☐ Fewer than 1 cigarette a day, on the average
2 ☐ 1-4 cigarettes
3 ☐ 5-9 cigarettes
4 ☐ 10-19 cigarettes
5 ☐ 20-29 cigarettes
6 ☐ 30-39 cigarettes
7 ☐ 40-49 cigarettes
8 ☐ 50 or more cigarettes
9 ☐ Not sure

30. **1 year from now**, how do you see yourself with regard to cigarette smoking? *(Check one box)*

1 ☐ Definitely a non-smoker
2 ☐ Probably a non-smoker
3 ☐ Maybe a smoker, maybe not
4 ☐ Probably a smoker
5 ☐ Definitely a smoker

31. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your immediate work area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

32. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your sleeping area or other non-working area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

33. Sleeping area

a. Approximately how many people occupy your sleeping quarters aboard ship when you are sleeping (not counting yourself)?

_____ _____ _____ people

b. Where is your bunk/bed?

Deck or floor designation: _____

Room or compartment number: _____

34. Working area

a. Approximately how many people occupy your work area when you are working?

_____ _____ _____ people

b. Where is your work area?

Deck or floor designation: _____

Room or compartment number: _____

Multiple areas *(Please specify areas)*: _____

35. During the **past 7 days**, on how many days did you have any alcoholic beverages? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦

(If 0, please skip to question 38)

36. On the days you drank any alcoholic beverage during the **past 7 days**, how many drinks did you usually have per day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no._____ _____

37. During the **past 7 days**,what was the largest number of alcoholic drinks you had in 1 day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no. _____ _____

38. *(Unmarried men and women)* When you are ashore, do you live with a significant other person in a marital-like relationship? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Don't know

39. My current: a. Weight is _____ _____ _____ pounds

b. Height is _____ feet and _____ _____ inches

QUALITY OF LIFE

40. How do you feel about your: *(Check one box on each line)*	Terrible (1)	Unhappy (2)	Mostly dissatisfied (3)	Mixed (4)	Mostly satisfied (5)	Pleased (6)	Delighted (7)
a. Job?	☐	☐	☐	☐	☐	☐	☐
b. Personal life?	☐	☐	☐	☐	☐	☐	☐
c. Health and physical condition?	☐	☐	☐	☐	☐	☐	☐
d. Life as a whole?	☐	☐	☐	☐	☐	☐	☐
e. Family?	☐	☐	☐	☐	☐	☐	☐
f. *(If married)* Spouse?	☐	☐	☐	☐	☐	☐	☐
g. *(If you have children)* Children?	☐	☐	☐	☐	☐	☐	☐

MOOD

41. How many days during the **past 7 days** have you: *(Check one box on each line)*	No days (0)	One day (1)	Two days (2)	Three days (3)	Four days (4)	Five days (5)	Six days (6)	Seven days (7)
a. Felt you just couldn't get going?	☐	☐	☐	☐	☐	☐	☐	☐
b. Felt sad?	☐	☐	☐	☐	☐	☐	☐	☐
c. Had trouble getting to sleep or staying asleep?	☐	☐	☐	☐	☐	☐	☐	☐
d. Felt that everything was an effort?	☐	☐	☐	☐	☐	☐	☐	☐
e. Felt lonely?	☐	☐	☐	☐	☐	☐	☐	☐
f. Felt you couldn't shake the blues?	☐	☐	☐	☐	☐	☐	☐	☐
g. Had trouble keeping your mind on what you were doing?	☐	☐	☐	☐	☐	☐	☐	☐

STRESS

42. Think about your whole life over the **past 2 weeks**. On the whole, how much stress do you think is in your life right now? *(Check one box)*	None at all (1) ☐	A little bit (2) ☐	Moderate amount (3) ☐	Quite a bit (4) ☐	Extreme amount (5) ☐

43. Of the stress that you experience, how much comes from problems or concerns with: *(Check one box on each line)*	Not at all (1)	A little bit (2)	Moderate amount (3)	Quite a bit (4)	Extreme amount (5)	Not applicable (9)
a. Financial matters	☐	☐	☐	☐	☐	☐
b. My personal health	☐	☐	☐	☐	☐	☐
c. Personal or health matters of a family member	☐	☐	☐	☐	☐	☐
d. Being aboard ship	☐	☐	☐	☐	☐	☐
e. Crowded conditions aboard ship	☐	☐	☐	☐	☐	☐
f. My personal safety aboard ship	☐	☐	☐	☐	☐	☐
g. Maintaining personal hygiene aboard ship	☐	☐	☐	☐	☐	☐
h. My lack of privacy aboard ship	☐	☐	☐	☐	☐	☐
i. My inability to get enough exercise aboard ship	☐	☐	☐	☐	☐	☐
j. The lack of recreational activities aboard ship	☐	☐	☐	☐	☐	☐
k. My nutrition, the unavailability of desired foods aboard ship	☐	☐	☐	☐	☐	☐
l. The person I work for (my immediate supervisor)	☐	☐	☐	☐	☐	☐
m. The people I work with (my peers)	☐	☐	☐	☐	☐	☐
n. The people who work for me (those I supervise)	☐	☐	☐	☐	☐	☐
o. The way things are typically done aboard ship	☐	☐	☐	☐	☐	☐
p. The people with whom I share living space aboard ship	☐	☐	☐	☐	☐	☐
q. My ability to perform my duties	☐	☐	☐	☐	☐	☐
r. My career and chances for promotion	☐	☐	☐	☐	☐	☐
s. Being able to stay in the Navy because of downsizing or force reductions	☐	☐	☐	☐	☐	☐
t. My relationship with my spouse or boyfriend/girlfriend	☐	☐	☐	☐	☐	☐
u. Breaking up with my spouse or boyfriend/girlfriend because of being aboard ship	☐	☐	☐	☐	☐	☐

43. —*Continued*— Of the stress that you experience, how much comes from problems or concerns with:
(Check one box on each line)

	Not at all (1)	A little bit (2)	Moderate amount (3)	Quite a bit (4)	Extreme amount (5)	Not applicable (9)
v. My ability to communicate with my family and friends	❐	❐	❐	❐	❐	❐
w. Adapting to life after I return from this deployment	❐	❐	❐	❐	❐	❐
x. Feeling confined or trapped	❐	❐	❐	❐	❐	❐
y. My personal future and the meaning of my life	❐	❐	❐	❐	❐	❐
z. My use of alcohol	❐	❐	❐	❐	❐	❐
aa. Feeling isolated and excluded	❐	❐	❐	❐	❐	❐
bb. Feeling out of touch with the rest of the world	❐	❐	❐	❐	❐	❐
cc. My life as a whole	❐	❐	❐	❐	❐	❐
dd. *(If you have children)* My children because of being aboard ship	❐	❐	❐	❐	❐	❐
ee. *(If you have children)* Discipline of children	❐	❐	❐	❐	❐	❐
ff. *(If you have children)* Child-care arrangements	❐	❐	❐	❐	❐	❐

44. During the **past 2 weeks**, the stresses listed above have affected my:
(Check one box on each line)

	Not at all (1)	A little bit (2)	Moderate amount (3)	Quite a bit (4)	Extreme amount (5)
a. Personal life	❐	❐	❐	❐	❐
b. Performance in my job	❐	❐	❐	❐	❐

45. During the **past 2 weeks**, how well have you coped with these stresses?
(Check one box)

Not at all (1)	A little bit (2)	Moderately well (3)	Quite a bit (4)	Extremely well (5)
❐	❐	❐	❐	❐

FAMILY COMPOSITION

46. Family structure

a. How many of your children (natural, adopted, or stepchildren) under the age of 21 live in your household? *(Fill in circles below)*

0 ☐ No children under 21 currently live in my household

Age of children	No. of children				
a. Under 6 weeks	①	②	③	④	⑤
b. 6 weeks to under 1 year	①	②	③	④	⑤
c. 12 to 23 months	①	②	③	④	⑤
d. 24 to 35 months	①	②	③	④	⑤
e. 3 to 5 years	①	②	③	④	⑤
f. 6 to 9 years	①	②	③	④	⑤
g. 10 to 12 years	①	②	③	④	⑤
h. 13 to 15 years	①	②	③	④	⑤
i. 16 to 20 years	①	②	③	④	⑤

b. *(Married men and women)* Is your spouse currently employed?

0 ☐ No
1 ☐ Yes, active-duty Navy
2 ☐ Yes, active-duty other military
3 ☐ Yes, civilian employment
4 ☐ Yes, self employed
9 ☐ Don't know

FAMILY AND FRIENDS

47. How many close friends do you have? *(Please fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ or more

48. How many relatives do you have that you feel close to? *(Please fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ or more

49. Altogether, how often do you see these people each month? *(Check one box)*

1 ☐ Almost every day
2 ☐ Several times a month
3 ☐ Not very often—maybe once or twice a month
4 ☐ Seldom—a few times a year
5 ☐ Almost never

50. Are you a member of any clubs or groups?
(Check one box)

1 ☐ No
2 ☐ Yes

51. Do you belong to a church, temple, or other religious organization?
(Check one box)

1 ☐ No
2 ☐ Yes

SOURCES OF HELP

52. If you experienced a personal problem, how helpful would the following individuals be to you? *(Check one box on each line)*	Very unhelpful (1)	Somewhat unhelpful (2)	Neutral (3)	Somewhat helpful (4)	Very helpful (5)	Not applicable (9)
a. Your family	☐	☐	☐	☐	☐	☐
b. Your friends on board ship	☐	☐	☐	☐	☐	☐
c. Other friends in the Navy	☐	☐	☐	☐	☐	☐
d. Other friends not in the Navy	☐	☐	☐	☐	☐	☐
e. Chaplains, ministers, or other clergy	☐	☐	☐	☐	☐	☐
f. Other Navy professionals	☐	☐	☐	☐	☐	☐
g. Your ship's leaders	☐	☐	☐	☐	☐	☐

HEALTH BELIEFS

53. Questions about your health beliefs
    a. The following items are about your health beliefs.

(Check one box on each line)

	Not at all (1)	Somewhat (2)	Frequently (3)	Very much so (4)
a. How often do you think about your health?	☐	☐	☐	☐
b. How concerned are you about your health?	☐	☐	☐	☐
c. How important do you think it is that people take special care of their health?	☐	☐	☐	☐
d. How likely is it that you will try to do a better job of taking care of your health in the future?	☐	☐	☐	☐
e. Compared to other people of your age, would you say you get ill much more often?	☐	☐	☐	☐
f. Compared to other people of your age, when you do get ill would you say you get ill much more often?	☐	☐	☐	☐
g. I seem to resist illness better than other people.	☐	☐	☐	☐
h. In general, when you get ill, how much does it interfere with your usual activities?	☐	☐	☐	☐
i. When I'm ill I try to keep going on as usual.	☐	☐	☐	☐
j. When I'm ill I cut back on whatever I'm doing in order to get well.	☐	☐	☐	☐

53. b. How likely do you feel, it is that you will develop any of the following problems in the **next 12 months**?

(Check one box on each line)

	Very unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
a. Weight problems	☐	☐	☐	☐
b. High blood pressure	☐	☐	☐	☐
c. Cancer	☐	☐	☐	☐
d. Heart disease	☐	☐	☐	☐
e. Stroke	☐	☐	☐	☐
f. Heart attack	☐	☐	☐	☐

53. c. How serious a health problem do you think the following would be if you were to develop them? *(Check one box on each line)*	Not at all severe (1)	Not severe (2)	Severe (3)	Very severe (4)
a. Weight problems	☐	☐	☐	☐
b. High blood pressure	☐	☐	☐	☐
c. Cancer	☐	☐	☐	☐
d. Heart disease	☐	☐	☐	☐
e. Stroke	☐	☐	☐	☐
f. Heart attack	☐	☐	☐	☐

53. d. Use this scale to answer the question: *(Check one box)*	Not at all effective (1)	Not effective (2)	Effective (3)	Very effective (4)
a. How effective do you think health screening is in reducing your chances of getting a serious illness?	☐	☐	☐	☐

53. e. Which of the following reasons would stop you from going to sick call? *(Check one box on each line)*	Very untrue (1)	Untrue (2)	True (3)	Very true (4)
a. It would take up a lot of my spare time.	☐	☐	☐	☐
b. I would have problems getting to an appointment.	☐	☐	☐	☐
c. It would be too much effort.	☐	☐	☐	☐
d. I have other more important things to do.	☐	☐	☐	☐
e. I'm uninterested.	☐	☐	☐	☐
f. I'm too lazy.	☐	☐	☐	☐
g. I might be "told off".	☐	☐	☐	☐
h. I already feel healthy.	☐	☐	☐	☐
i. I don't know enough about it.	☐	☐	☐	☐
j. I'm already seeing the doctor a lot.	☐	☐	☐	☐
k. Fear of the results of screening -- of what they might find.	☐	☐	☐	☐
l. It would be embarrassing.	☐	☐	☐	☐
m. Would you be worried about any aspects of a screening appointment?	☐	☐	☐	☐

CASUALTY EVENTS

Witnessing a disaster or violence can sometimes have long-term effects. The following questions will help to provide a baseline of history of exposure to disasters or violence that may help in studying the effects of combat.

54. Have you ever participated in a real mass casualty or a real disaster involving 5 or more major injuries or fatalities?
(Check one box)

1 ☐ No
2 ☐ Yes

(Please describe your participation and events)

When: _____

Where: _____

What happened: _____

Your role: _____

a. What was your official status at the time you participated in this event?
(Check one box)

1 ☐ Active-duty military
2 ☐ Civilian
9 ☐ Other (*Please describe*):_____

b. Have you ever seen a person die by violent means?
(Check one box)

1 ☐ No
2 ☐ Yes *(Please describe your participation and events)*

When: _____

Where: _____

What happened: _____

Your role: _____

WOMEN'S SECTION

HEALTH CONDITIONS (WOMEN)

55. Reproductive system health

Condition	a. Did you have this condition in the **past 90 days?** *(Check one box on each line)*			b. If yes, did you first notice the condition, or did it get worse, **since you came aboard this ship?** *(Check one box on each line if answer to the condition is "yes")*		
	No (1)	Yes (2)	Not sure (9)	First noticed (1)	Got worse (2)	Not sure (9)
a. Bleeding between periods	☐	☐	☐	☐	☐	☐
b. Cramps or pain during menstrual period requiring medication or time off work	☐	☐	☐	☐	☐	☐
c. Excessive frequency of periods (time between periods too short)	☐	☐	☐	☐	☐	☐
d. Heavy periods (excessive menstrual flow)	☐	☐	☐	☐	☐	☐
e. Period lasting longer than 1 week	☐	☐	☐	☐	☐	☐
f. Scanty menstrual flow	☐	☐	☐	☐	☐	☐
g. Abdominal pain (from known cysts)	☐	☐	☐	☐	☐	☐
h. Abdominal pain (from known endometriosis)	☐	☐	☐	☐	☐	☐
i. Abdominal pain (from other or unknown cause) *(Specify:)*	☐	☐	☐	☐	☐	☐
j. Discharge from breast	☐	☐	☐	☐	☐	☐
k. Breast lump	☐	☐	☐	☐	☐	☐
l. Other symptoms related to menstrual period *(Specify:)*	☐	☐	☐	☐	☐	☐

56. Did any of the conditions listed above (a through l) require you to:

a. Take 2 or more hours off from work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

57. During the **past 12 months h**ave you had regular menstrual periods? *(Check one box)*

1 ☐ No
(Please explain:_____

_____

2 ☐ Yes, about 1 per month.
3 ☐ Yes, but not 1 per month.
(Please explain:_____

_____

If you missed one or more periods during the past 12 months, please check one box below:

1 ☐ I missed my period approximately ____ ____ time(s) during the **past 12 months.**
0 ☐ I had no periods at all during the **past 12 months.**
9 ☐ I'm not sure of the number of periods I missed during the **past 12 months.**

58. During the **past 90 days** have you taken birth control pills <u>to regulate your period</u>? *(Check one box)*

1 ☐ No 2 ☐ Yes

59. During the **past 90 days** have you taken replacement estrogens? *(Check one box)*

1 ☐ No
2 ☐ Yes, hormone pills
3 ☐ Yes, hormone creams or other hormone preparations

60. Did you have any of these during **past 90 days**? *(Please check either "no" or "yes" for every condition listed)*

a. 1 ☐ No 2 ☐ Yes Urinary tract infection
b. 1 ☐ No 2 ☐ Yes Vaginal rash, discharge, or other vaginal disorder except yeast infection, not including sexually transmitted diseases
c. 1 ☐ No 2 ☐ Yes Yeast infection
d. 1 ☐ No 2 ☐ Yes Pelvic or lower abdominal pain
e. 1 ☐ No 2 ☐ Yes Gonorrhea
f. 1 ☐ No 2 ☐ Yes Other sexually-transmitted disease
g. 1 ☐ No 2 ☐ Yes Other genitourinary system condition
*(Please specify):*_____

61. Did any of the conditions listed above (a through g) require you to:

a. Take 2 or more hours off from work during the **past 90 days**? *(Check one box)*

1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**? *(Check one box)*

1 ☐ No 2 ☐ Yes

62. During the past 12 months have you usually had regular menstrual periods? *(Check one box)*

1 ☐ No *(Please specify):*_____
2 ☐ Yes, about one per month
3 ☐ Yes, but not one per month

63. Has a doctor *ever* told you that you had any of the following?

(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Abnormal Pap smear (test for cervical cancer)	☐	☐	____ ____
b. Breast lump diagnosed as benign breast cyst or fibrocystic disease *(Please specify):*	☐	☐	____ ____
c. Benign breast lump, exact diagnosis unknown	☐	☐	____ ____
d. Breast cancer	☐	☐	____ ____

PREGNANCY HISTORY

64. How many times have you been pregnant? *(Check one box)*

0 ☐ Never *(Please skip to question 68)*
1 ☐ I have been pregnant _____ _____ times.

65. Have you been pregnant during the **past 12 months**? *(Check one box)*

1 ☐ No
2 ☐ Yes

66. Are you pregnant now?
(Check one box)

1 ☐ No
2 ☐ Yes
3 ☐ Not sure

67. How many babies (live births) have you had?
(Fill in one circle)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ or more

68. What is your best estimate of the likelihood that you will become pregnant in the **next 12 months**?

*(Fill in a number between 0 and 100, with 0 representing **no chance** that the event will occur, and 100 representing that the event **definitely** will occur):*

_____ _____ _____ percent

69. Please provide the following information in chronological order. For multiple outcomes, make each a separate entry (e.g., two entries for twins). Indicate only one "outcome" per pregnancy. If you are uncertain of a detail, provide your best estimate.

Pregnancy

	Outcome	What was the approximate date of this outcome?	Were you in the Navy at the time?	What was your duty station type at the time of: Conception	What was your duty station type at the time of: Outcome	Was this pregnancy planned?
a. Most recent	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
b. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
c. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
d. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
e. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No

OB/GYN AVAILABILITY

70. During the **past 30 days** the following were readily available to me from this ship's medical department, if I needed them: *(Check one box on each line)*	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	I did not need this item (9)
a. Birth control pills	❐	❐	❐	❐	❐	❐
b. Depo-Provera, Norplant	❐	❐	❐	❐	❐	❐
c. Condoms	❐	❐	❐	❐	❐	❐
d. Diaphragm	❐	❐	❐	❐	❐	❐
e. Pregnancy testing or test kit	❐	❐	❐	❐	❐	❐
f. Family planning information	❐	❐	❐	❐	❐	❐
g. Appropriately staffed and equipped OB/GYN medical support	❐	❐	❐	❐	❐	❐

71. Approximately how many months or days ago was your most recent: *(Fill in number of months or days for each item)*	**Number of months**	**Number of days** *(if less than 1 month)*
a. Pap smear (test for cervical cancer)?	____ ____	____ ____
d. Pelvic examination?	____ ____	____ ____
e. Breast examination by a physician or nurse	____ ____	____ ____

OB/GYN QUESTIONS FOR CURRENTLY DEPLOYED WOMEN

72. Did you request a pre-deployment appointment with a gynecologist or obstetrician from a Navy medical facility prior to this deployment?? *(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")* *(Check one box)*

1 ❐ No *(Please skip to Comments and Suggestions on the last page)*
2 ❐ Yes

73. Were you given a gynecological or obstetrical appointment? *(Check one box)*

1 ❐ No *(Please skip to Comments and Suggestions on the last page)*
2 ❐ Yes

a. Did you keep the appointment? *(Check one box)*

1 ❐ No
2 ❐ Yes

ADDITIONAL COMMENTS AND SUGGESTIONS

Additional comments you would like to add:

Suggestions for topics that should be added, changed, or deleted:

THANK YOU!

Please return to your shipboard coordinator or:

Naval Health Research Center
Code 233
P.O. Box 85122
San Diego CA 92186-5122
Telephone (619) 553-6881; DSN 553-6881

APPENDIX C.4

Survey 78

U.S. Navy Shipboard Health Survey

Naval Health Research Center, San Diego

Information to participants

You are being asked to voluntarily complete this survey giving candid responses and opinions about health-related issues and to become part of a study that will involve one or more additional questionnaires. Your answers are for research use only and will be kept strictly confidential. Data will be reported so that no individual participant can be identified and the information you provide will not become part of anyone's official records. If you have any questions about this survey, please contact Dr. Frank C. Garland, Naval Health Research Center, San Diego, CA 92186-5122/DSN: 553-6881; Commercial (619) 553-6881.

Privacy Act Statement

1. Authority. 5 USC 301, 10 USC 1071. OPNAV Control Symbol 6000-13C. **2. Purpose.** Medical research information will be collected to enhance basic medical knowledge concerning medical care and health promotion. **3. Routine use.** Medical research information will be used in statistical analyses by the Departments of the Navy, Defense, and other U.S. Government agencies, provided this is compatible with the purpose for which information was collected. Use of the information may be granted to non-Government agencies by the Chief, Bureau of Medicine and Surgery, in accordance with the provisions of the Freedom of Information Act. **4. Voluntary disclosure.** I understand that all information derived from the study will be retained at the Naval Health Research Center, San Diego, and that my anonymity will be maintained. I voluntarily agree to its disclosure to agencies or individuals identified in the preceding paragraph, and I have been informed that failure to agree to its disclosure to agencies or individuals identified in the preceding paragraph. I understand that my provision of information is voluntary, and that I am free to discontinue filling out the questionnaire and withdraw from the study at any time without prejudice or loss of medical treatment or privileges to which I would otherwise be entitled.

A. Name (please print):

Last First Middle Initial

B. Social security number: ___ ___ ___ -- ___ ___ -- ___ ___ ___ ___

C. Date of birth: Month: ___ ___ Day: ___ ___ Year: 19 ___ ___

Shipboard Form 78 Questionnaire
THIS PAGE IS TO BE COMPLETED BY ALL STUDY PARTICIPANTS AND WILL BE REMOVED BEFORE PROCESSING.
Note: Questionnaires may be distributed by active-duty, reserve, or civilian personnel.
Rev. 7.0 (31 May 95)

Voluntary Consent to Participate in the U.S. Navy Shipboard Health Survey

1. I am being asked to volunteer to participate in a research study titled, "Health Aboard Navy Ships: A Comprehensive Health and Readiness Research Project" The purpose of this study is to enhance basic medical knowledge concerning the provision of medical care and health promotion. I am being asked to participate now, and can expect to receive a follow-up questionnaire in about 1 year if I am still on active duty.

2. I understand that my participation in this study is completely voluntary. If I do not choose to participate there are no penalties, and I will not lose any benefits to which I am otherwise entitled. I may discontinue my participation in this study at any time I choose without fear of penalty or loss of benefits to which I am otherwise entitled.

3. The benefit that I may expect from my participation in this research study is the knowledge that I will be helping the Navy to provide the best possible medical services to men and women serving aboard Navy ships. There is no direct personal benefit to me from participation in this research study.

4. The investigators believe that there are no direct physical or psychological risks to me as a participant in this research study, with the possible exception of a very unlikely accidental breach of confidentiality and loss of anonymity. Specific measures to ensure my anonymity are outlined in paragraph 5.

5. Confidentiality during this research study will be ensured by restricting access to all data collected to personnel working on this research study who have taken an oath of confidentiality. The confidentiality of the information related to my participation in this research study will be ensured at all times by use of an arbitrary number to identify me. I also understand that none of my responses will become a part of my medical or military record and that no information that might identify me personally will be included in results from reports of this study. Thank you! the anonymous portion of this contains no personal identifiers and cannot be linked to me in any way.

6. If I have questions about this research study I should contact the principal investigator, Dr. Frank C. Garland at the Naval Health Research Center (NHRC), San Diego, CA 92186-5122, phone (619) 553-6881; DSN 553-6881. If I have questions about the ethical aspects of this study, my rights as a volunteer, or any concerns relating to protection of research volunteers, I can contact Dr. Tamsin Kelly at NHRC, phone (619) 553-8443; DSN 553-8443. Additionally, I may contact Dr. Lisa Meyer at NHRC if I have any questions about medical aspects of this study. Dr. Meyer may be contacted at NHRC, phone (619) 553-8376; DSN: 553-8376.

7. I have been informed that Dr. Frank C. Garland is responsible for the storage of my consent form and the research records related to my participation in this study. These records are stored at the Naval Health Research Center, San Diego, CA 92186-5122.

8. I have been given an opportunity to ask questions about this study and its related procedures and risks, as well as any of the other information contained in this consent form. All my questions have been answered to my satisfaction. By my signature below, I give my voluntary informed consent to participate in this research study as it has been explained to me and acknowledge receipt of a copy of this form for my own personal records.

_____
(Last name, first name, middle initial)

_____ _____
(Signature) Date (DD/MM/YY)

--This page will be removed and stored separately to protect your confidentiality--

DEMOGRAPHIC DATA

1. Today's date: Month: ____ ____ Day: ____ ____ Year: 199 ___

2. What is your gender?

   1 ☐ Male
   2 ☐ Female

3. What is your age in years? ____ ____ years

4. What is your race? *(Check one box)*

   1 ☐ White, non-Hispanic
   2 ☐ White, Hispanic
   3 ☐ Black/African-American, non-Hispanic
   4 ☐ Black/African-American, Hispanic
   5 ☐ Asian/Pacific Islander
   6 ☐ Native American
   9 ☐ Other *(Please specify):*_____

5. What is the highest level of education you have completed?
   (Check one box)

   1 ☐ Some high school
   2 ☐ Graduate equivalency degree (GED)
   3 ☐ High school graduate
   4 ☐ Trade or technical school graduate
   5 ☐ Some college or AA degree
   6 ☐ 4-year college degree
   7 ☐ Graduate or professional degree

6. Marital status
   a. What is your current marital status?
   (Check one box)

   1 ☐ Never married
   2 ☐ Married *(Please skip to question 7)*
   3 ☐ Separated
   4 ☐ Divorced
   5 ☐ Widowed

   b. Do you plan to marry during the **next 12 months**?
   (Check one box)

   1 ☐ No
   2 ☐ Yes
   3 ☐ Don't know

7. What is your paygrade? *(Circle one)*

Enlisted		Warrant officer	Officer	
E-1	E-6	W-1	O-1	O-6
E-2	E-7	W-2	O-2	
E-3	E-8	W-3	O-3	
E-4	E-9	W-4	O-4	
E-5			O-5	

8. If you are Navy enlisted, what is your rating (e.g., SN, FN, BT, HM, ASM)? ___ ___ ___

9. If you are Marine enlisted, what is your M.O.S. number? ____ ____ ____ ____

10. What is your total number of years on active duty? ____ ____ years

11. Times aboard ship(s)

    a. What is the approximate total time you have served aboard ship counting all time on **all** ships on which you have served?
    _____ _____ years and _____ _____ months

    b. What is the approximate total time time you served aboard this ship?
    _____ _____ years and _____ _____ months

12. Where do you live when your ship is in your home port?
(Check one box)

    1 ☐ Aboard ship
    2 ☐ Navy Housing
    3 ☐ BEQ/BOQ
    9 ☐ Other

13. To what ship (or command) are you currently assigned? _____

14. If you are currently aboard ship, what is your ship's current status?
*(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")*
(Check one box)

    1 ☐ In home port
    2 ☐ At sea
    3 ☐ In port other than home port
    4 ☐ In shipyard
    9 ☐ Other *(Please specify):*_____

15. Are you currently deployed (**30 days or more**)?
(Check one box)

    1 ☐ No *(Please skip to question 18)*
    2 ☐ Yes

16. What date did you begin this deployment? Mo.:____ ____ Day: ____ ____ Year: 199___

17. If you are out of your home port, what is the expected length of time between today and the date you return to your home port?
(Check one box)

1 ☐ Less than 1 week
2 ☐ 1 week to less than 1 month
3 ☐ 1 month to less than 3 months
4 ☐ 3 months to less than 6 months
5 ☐ 6 months to less than 12 months
6 ☐ 12 months to less than 18 months
7 ☐ 18 months or longer

18. How many times have you deployed aboard Navy ships (**30 days or more**), not counting present deployment? *(Check one box)*

0 ☐ Never ☐ ____ ____ times

HEALTH CONDITIONS

This section is to report all conditions that you had during the **past 30 days** regardless of **whether or not** they resulted in a visit to sick call or a health care provider.

19. Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

a.	1☐ No	2☐ Yes	Common cold symptoms
b.	1☐ No	2☐ Yes	Dizziness
c.	1☐ No	2☐ Yes	Chills
d.	1☐ No	2☐ Yes	Cough
e.	1☐ No	2☐ Yes	Sore throat
f.	1☐ No	2☐ Yes	Fever
g.	1☐ No	2☐ Yes	Flu
h.	1☐ No	2☐ Yes	Diarrhea lasting **at least 3 days**
i.	1☐ No	2☐ Yes	Stomach problems
j.	1☐ No	2☐ Yes	Constipation
k.	1☐ No	2☐ Yes	Indigestion
l.	1☐ No	2☐ Yes	Nausea/vomiting
m.	1☐ No	2☐ Yes	Sinus trouble
n.	1☐ No	2☐ Yes	Hay fever
o.	1☐ No	2☐ Yes	Shortness of breath
p.	1☐ No	2☐ Yes	Hoarseness
q.	1☐ No	2☐ Yes	Skin problems
r.	1☐ No	2☐ Yes	Muscle sprain or strain
s.	1☐ No	2☐ Yes	Back problems
t.	1☐ No	2☐ Yes	Hearing problems
u.	1☐ No	2☐ Yes	Irritated eyes
v.	1☐ No	2☐ Yes	Trouble seeing with one or both eyes even if wearing glasses or contacts

19. —*Continued*— Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

w. 1☐ No 2☐ Yes Pain in stomach or abdominal area
x. 1☐ No 2☐ Yes Heat stress or heat stroke
y. 1☐ No 2☐ Yes Headache:
If yes, was it accompanied by: *(Please check either "no" or "yes" for every condition)*
1☐ No 2☐ Yes Visual disturbances
1☐ No 2☐ Yes Numbness or tingling
1☐ No 2☐ Yes Sensitivity to noise
1☐ No 2☐ Yes Sensitivity to light
1☐ No 2☐ Yes Nausea
z. 1☐ No 2☐ Yes Psychological condition(s) or personal problem(s) severe enough to interfere with daily activities
aa. 1☐ No 2☐ Yes Other condition or injury
Please specify : _____
bb. 1☐ No 2☐ Yes *(Women)* Menstrual conditions (premenstrual syndrome, menstrual cramps, irregular or absent periods)

20. During the **past 30 days:**

a. Did you receive a doctor's diagnosis of any of these from a health care provider not on this ship **?**
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Cold or acute nasopharyngitis
2. 1☐ No 2☐ Yes Sore throat, viral
3. 1☐ No 2☐ Yes Cough, viral
4. 1☐ No 2☐ Yes Flu

b. Have you been unable to perform your military duties for 1 or more days because of the reasons below?
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Health problem
2. 1☐ No 2☐ Yes Emotional problem
3. 1☐ No 2☐ Yes Personal problem
4. 1☐ No 2☐ Yes Family problem
5 1☐ No 2☐ Yes Other *(Please specify :)* _____

_____

_____

MEDICAL HISTORY

21. Has a doctor *ever* told you that you had any of the following? *(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)*	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Asthma	☐	☐	____ ____
b. Migraine headache	☐	☐	____ ____
c. Anemia	☐	☐	____ ____
d. Depression	☐	☐	____ ____
e. Gonorrhea	☐	☐	____ ____
f. Syphilis	☐	☐	____ ____
g. Chlamydia	☐	☐	____ ____
h. Urinary tract infection	☐	☐	____ ____
i. Kidney infection	☐	☐	____ ____
j. Hernia (other than hiatal)	☐	☐	____ ____

RECENT MEDICAL CARE

22. Approximately how many months or days ago was your: *(Fill in number of months or days for each item)*	Number of months	Number of days *(if less than 1 month)*
a. Most recent visit to a medical doctor?	____ ____	____ ____
b. Most recent visit to another health care professional? *(Please specify type of provider, e.g., psychologist, dentist, nurse-practitioner)*:	____ ____	____ ____
c. Most recent visit to a hospital corpsman?	____ ____	____ ____

23. If you are currently deployed **(30 days or more)**, were you medically screened preceding this deployment?
(Check one box)

1 ☐ No
2 ☐ Yes
9 ☐ Not applicable, since I am not currently deployed.

24. In what month and year were you last screened? Month: ____ ____ Year: 199 ____

OCCUPATIONAL EXPOSURES

25. Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	Past 30 days: No. of days exposed per week	Past 36 months: No. of days exposed per week	Past 36 months: Total no. of mos. exposed
a. Adhesives or gluing compounds	☐	☐	☐				
b. Asbestos (loose)	☐	☐	☐				
c. Carbon monoxide	☐	☐	☐				
d. Diesel exhaust within 50 feet	☐	☐	☐				
e. Diesel fuel within 50 feet	☐	☐	☐				
f. Dry cleaning solvent	☐	☐	☐				
g. Exhaust from gasoline engine	☐	☐	☐				
h. Gasoline (liquid or vapor)	☐	☐	☐				
i. Guided missile fuel	☐	☐	☐				
j. High temperature (above 95°F)	☐	☐	☐				
k. Hypodermic needles (used)	☐	☐	☐				
l. Insecticides	☐	☐	☐				
m. Jet exhaust within 50 feet	☐	☐	☐				
n. Jet fuel within 50 feet	☐	☐	☐				
o. Lifting 25 - 49 pounds	☐	☐	☐				
p. Lifting 50 or more pounds	☐	☐	☐				
q. Loud noise (such as jets)	☐	☐	☐				
r. Low temperature (below 32° F)	☐	☐	☐				
s. Metal scrapings or filings	☐	☐	☐				
t. Microwave oven within 3 feet	☐	☐	☐				
u. Paint (oil based), or thinner	☐	☐	☐				
v. Paint, other or unknown type	☐	☐	☐				
w. Paint scrapings or paint sanding	☐	☐	☐				
x. Radar antenna or array within 50 feet	☐	☐	☐				
y. Solvent or degreaser	☐	☐	☐				
z. Torpedo fuel	☐	☐	☐				

25. —*Continued*—Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	If yes: During the Past 30 days: No. of days exposed per week	If yes: During the Past 36 months: No. of days exposed per week	If yes: During the Past 36 months: Total no. of mos. exposed
aa. Other chemicals *(Please specify):*	☐	☐	☐				
bb. Transmitting antennas within 50 feet	☐	☐	☐				
cc. Nuclear reactor within 50 feet	☐	☐	☐				
dd. Nuclear fuel within 50 feet	☐	☐	☐				
ee. Nuclear ordnance within 50 feet	☐	☐	☐				
ff. Nuclear medicines (radioisotopes)	☐	☐	☐				
gg. Video display terminal (VDT, CRT)	☐	☐	☐				
hh. Welding fumes	☐	☐	☐				
ii. Dust or particles	☐	☐	☐				
jj. Explosives (nonnuclear) within 50 feet	☐	☐	☐				
kk. Nitrous oxide	☐	☐	☐				
ll. Ethylene dibromide (EDB)	☐	☐	☐				
mm. Perchlorethylene (PERC)	☐	☐	☐				
nn. Anthrax vaccine	☐	☐	☐	Year first received 19 ___ ___		Year last received 19 ___ ___	
oo. Antimalaria pills	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
pp. Pyridostigmine	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
qq. Other anti-CBW pills or agents *(Please specify):*	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	

PROTECTIVE GEAR

26. Is protective gear available for use in your current job?
(Please check one box in each of the four columns)

Item	Is this item available?			Does it fit you properly?			Do you wear it when needed?			Does it seriously interfere with your ability to do your work?		
	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)
a. Gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b. Respirator or mask	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c. Protective gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d. Boots	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e. Ear plugs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f. Film badges	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g. Hazardous materials suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h. Fire fighting suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

LIFESTYLE

27. Have you smoked at least 100 cigarettes in **your entire life**? *(Check one box)*

1 ☐ No *(Please skip to question 30)*
2 ☐ Yes

28. On how many of the **past 30 days** did you smoke cigarettes? *(Check one box)*

0 ☐ None
1 ☐ 1-4 days
2 ☐ 5-9 days
3 ☐ 10-14 days
4 ☐ 15-19 days
5 ☐ 20-24 days
6 ☐ 25-29 days
7 ☐ Every day
9 ☐ Not sure

29. On average, about how many cigarettes did you smoke per day during the **past 30 days**? *(Check one box)*

0 ☐ None
1 ☐ Fewer than 1 cigarette a day, on the average
2 ☐ 1-4 cigarettes
3 ☐ 5-9 cigarettes
4 ☐ 10-19 cigarettes
5 ☐ 20-29 cigarettes
6 ☐ 30-39 cigarettes
7 ☐ 40-49 cigarettes
8 ☐ 50 or more cigarettes
9 ☐ Not sure

30. **1 year from now**, how do you see yourself with regard to cigarette smoking? *(Check one box)*

1 ☐ Definitely a non-smoker
2 ☐ Probably a non-smoker
3 ☐ Maybe a smoker, maybe not
4 ☐ Probably a smoker
5 ☐ Definitely a smoker

31. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your immediate work area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

32. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your sleeping area or other non-working area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

33. Sleeping area

a. Approximately how many people occupy your sleeping quarters aboard ship when you are sleeping (not counting yourself)?

_____ _____ _____ people

b. Where is your bunk/bed?

Deck or floor designation: _____

Room or compartment number: _____

34. Working area

a. Approximately how many people occupy your work area when you are working?

_____ _____ _____ people

b. Where is your work area?

Deck or floor designation: _____

Room or compartment number: _____

Multiple areas *(Please specify areas)*: _____

35. During the **past 7 days**, on how many days did you have any alcoholic beverages? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦

(If 0, please skip to question 38)

36. On the days you drank any alcoholic beverage during the **past 7 days**, how many drinks did you usually have per day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no._____ _____

37. During the **past 7 days**,what was the largest number of alcoholic drinks you had in 1 day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no. _____ _____

38. *(Unmarried men and women)* When you are ashore, do you live with a significant other person in a marital-like relationship? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Don't know

39. My current: a. Weight is _____ _____ _____ pounds

b. Height is _____ feet and _____ _____ inches

QUALITY OF LIFE

40 How do you feel about your: *(Check one box on each line)*	Terrible (1)	Unhappy (2)	Mostly dissatisfied (3)	Mixed (4)	Mostly satisfied (5)	Pleased (6)	Delighted (7)
a. Job?	❒	❒	❒	❒	❒	❒	❒
b. Personal life?	❒	❒	❒	❒	❒	❒	❒
c. Health and physical condition?	❒	❒	❒	❒	❒	❒	❒
d. Life as a whole?	❒	❒	❒	❒	❒	❒	❒
e. Family?	❒	❒	❒	❒	❒	❒	❒
f. *(If married)* Spouse?	❒	❒	❒	❒	❒	❒	❒
g. *(If you have children)* Children?	❒	❒	❒	❒	❒	❒	❒

MOOD

41. How many days during the **past 7 days** have you: *(Check one box on each line)*	No days (0)	One day (1)	Two days (2)	Three days (3)	Four days (4)	Five days (5)	Six days (6)	Seven days (7)
a. Felt you just couldn't get going?	❒	❒	❒	❒	❒	❒	❒	❒
b. Felt sad?	❒	❒	❒	❒	❒	❒	❒	❒
c. Had trouble getting to sleep or staying asleep?	❒	❒	❒	❒	❒	❒	❒	❒
d. Felt that everything was an effort?	❒	❒	❒	❒	❒	❒	❒	❒
e. Felt lonely?	❒	❒	❒	❒	❒	❒	❒	❒
f. Felt you couldn't shake the blues?	❒	❒	❒	❒	❒	❒	❒	❒
g. Had trouble keeping your mind on what you were doing?	❒	❒	❒	❒	❒	❒	❒	❒

STRESS

42. Think about your whole life over the **past 2 weeks**. On the whole, how much stress do you think is in your life right now? *(Check one box)*	None at all (1)	A little bit (2)	Moderate amount (3)	Quite a bit (4)	Extreme amount (5)
	❒	❒	❒	❒	❒

43. Of the stress that you experience, how much comes from problems or concerns with: *(Check one box on each line)*	Not at all (1)	A little bit (2)	Moderate amount (3)	Quite a bit (4)	Extreme amount (5)	Not applicable (9)
a. Financial matters	☐	☐	☐	☐	☐	☐
b. My personal health	☐	☐	☐	☐	☐	☐
c. Personal or health matters of a family member	☐	☐	☐	☐	☐	☐
d. Being aboard ship	☐	☐	☐	☐	☐	☐
e. Crowded conditions aboard ship	☐	☐	☐	☐	☐	☐
f. My personal safety aboard ship	☐	☐	☐	☐	☐	☐
g. Maintaining personal hygiene aboard ship	☐	☐	☐	☐	☐	☐
h. My lack of privacy aboard ship	☐	☐	☐	☐	☐	☐
i. My inability to get enough exercise aboard ship	☐	☐	☐	☐	☐	☐
j. The lack of recreational activities aboard ship	☐	☐	☐	☐	☐	☐
k. My nutrition, the unavailability of desired foods aboard ship	☐	☐	☐	☐	☐	☐
l. The person I work for (my immediate supervisor)	☐	☐	☐	☐	☐	☐
m. The people I work with (my peers)	☐	☐	☐	☐	☐	☐
n. The people who work for me (those I supervise)	☐	☐	☐	☐	☐	☐
o. The way things are typically done aboard ship	☐	☐	☐	☐	☐	☐
p. The people with whom I share living space aboard ship	☐	☐	☐	☐	☐	☐
q. My ability to perform my duties	☐	☐	☐	☐	☐	☐
r. My career and chances for promotion	☐	☐	☐	☐	☐	☐
s. Being able to stay in the Navy because of downsizing or force reductions	☐	☐	☐	☐	☐	☐
t. My relationship with my spouse or boyfriend/girlfriend	☐	☐	☐	☐	☐	☐
u. Breaking up with my spouse or boyfriend/girlfriend because of being aboard ship	☐	☐	☐	☐	☐	☐

43. —*Continued*— Of the stress that you experience, how much comes from problems or concerns with: *(Check one box on each line)*	Not at all (1)	A little bit (2)	Moderate amount (3)	Quite a bit (4)	Extreme amount (5)	Not applicable (9)
v. My ability to communicate with my family and friends	❐	❐	❐	❐	❐	❐
w. Adapting to life after I return from this deployment	❐	❐	❐	❐	❐	❐
x. Feeling confined or trapped	❐	❐	❐	❐	❐	❐
y. My personal future and the meaning of my life	❐	❐	❐	❐	❐	❐
z. My use of alcohol	❐	❐	❐	❐	❐	❐
aa. Feeling isolated and excluded	❐	❐	❐	❐	❐	❐
bb. Feeling out of touch with the rest of the world	❐	❐	❐	❐	❐	❐
cc. My life as a whole	❐	❐	❐	❐	❐	❐
dd. *(If you have children)* My children because of being aboard ship	❐	❐	❐	❐	❐	❐
ee. *(If you have children)* Discipline of children	❐	❐	❐	❐	❐	❐
ff. *(If you have children)* Child-care arrangements	❐	❐	❐	❐	❐	❐

44. During the **past 2 weeks**, the stresses listed above have affected my: *(Check one box on each line)*	Not at all (1)	A little bit (2)	Moderate amount (3)	Quite a bit (4)	Extreme amount (5)
a. Personal life	❐	❐	❐	❐	❐
b. Performance in my job	❐	❐	❐	❐	❐

45. During the **past 2 weeks**, how well have you coped with these stresses? *(Check one box)*	Not at all (1)	A little bit (2)	Moderately well (3)	Quite a bit (4)	Extremely well (5)
	❐	❐	❐	❐	❐

FAMILY COMPOSITION

46. Family structure

a. How many of your children (natural, adopted, or stepchildren) under the age of 21 live in your household? *(Fill in circles below)*

0 ❒ No children under 21 currently live in my household

Age of children	No. of children				
a. Under 6 weeks	①	②	③	④	⑤
b. 6 weeks to under 1 year	①	②	③	④	⑤
c. 12 to 23 months	①	②	③	④	⑤
d. 24 to 35 months	①	②	③	④	⑤
e. 3 to 5 years	①	②	③	④	⑤
f. 6 to 9 years	①	②	③	④	⑤
g. 10 to 12 years	①	②	③	④	⑤
h. 13 to 15 years	①	②	③	④	⑤
i. 16 to 20 years	①	②	③	④	⑤

b. *(Married men and women)* Is your spouse currently employed?

0 ❒ No
1 ❒ Yes, active-duty Navy
2 ❒ Yes, active-duty other military
3 ❒ Yes, civilian employment
4 ❒ Yes, self employed
9 ❒ Don't know

FAMILY AND FRIENDS

47. How many close friends do you have? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ or more

48. How many relatives do you have that you feel close to? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ or more

49. Altogether, how often do you see these people each month? *(Check one box)*

1 ❒ Almost every day
2 ❒ Several times a month
3 ❒ Not very often—maybe once or twice a month
4 ❒ Seldom—a few times a year
5 ❒ Almost never

50. Are you a member of any clubs or groups?
(Check one box)

1 ☐ No
2 ☐ Yes

51. Do you belong to a church, temple, or other religious organization?
(Check one box)

1 ☐ No
2 ☐ Yes

SOURCES OF HELP

52. If you experienced a personal problem, how helpful would the following individuals be to you? *(Check one box on each line)*	Very unhelpful (1)	Somewhat unhelpful (2)	Neutral (3)	Somewhat helpful (4)	Very helpful (5)	Not applicable (9)
a. Your family	☐	☐	☐	☐	☐	☐
b. Your friends on board ship	☐	☐	☐	☐	☐	☐
c. Other friends in the Navy	☐	☐	☐	☐	☐	☐
d. Other friends not in the Navy	☐	☐	☐	☐	☐	☐
e. Chaplains, ministers, or other clergy	☐	☐	☐	☐	☐	☐
f. Other Navy professionals	☐	☐	☐	☐	☐	☐
g. Your ship's leaders	☐	☐	☐	☐	☐	☐

53. Below is a list of problems and complaints that people sometimes have. Read each one carefully, and select the box that best describes how much **DISCOMFORT** that problem has caused you **DURING THE PAST WEEK.**

(Check one box on each line)

	None (1)	A little bit (2)	Moderate (3)	Quite a bit (4)	Extreme (5)
a. Nervousness or shakiness inside	☐	☐	☐	☐	☐
b. Repeated unpleasant thoughts	☐	☐	☐	☐	☐
c. Faintness or dizziness	☐	☐	☐	☐	☐
d. Loss of sexual interest or pleasure	☐	☐	☐	☐	☐
e. Feeling critical of others	☐	☐	☐	☐	☐
f. The idea that someone else can control your thoughts	☐	☐	☐	☐	☐
g. Feeling others are to blame for most of your troubles	☐	☐	☐	☐	☐
h. Trouble remembering things	☐	☐	☐	☐	☐
i. Feeling easily annoyed or irritated	☐	☐	☐	☐	☐
j. Pains in heart or chest	☐	☐	☐	☐	☐
k. Feeling afraid in open spaces	☐	☐	☐	☐	☐
l. Feeling low in energy or slowed down	☐	☐	☐	☐	☐
m. Thoughts of ending your life	☐	☐	☐	☐	☐
n. Feeling that most people cannot be trusted	☐	☐	☐	☐	☐
o. Poor appetite	☐	☐	☐	☐	☐
p. Crying easily	☐	☐	☐	☐	☐
q. Suddenly scared for no reason	☐	☐	☐	☐	☐
r. Temper outbursts that you could not control	☐	☐	☐	☐	☐
s. Feeling lonely even when you are with people	☐	☐	☐	☐	☐
t. Feeling blocked in getting things done	☐	☐	☐	☐	☐
u. Feeling lonely	☐	☐	☐	☐	☐
v. Feeling blue	☐	☐	☐	☐	☐

53. —*Continued*— Below is a list of problems and complaints that people sometimes have. Read each one carefully, and select the box that best describes how much **DISCOMFORT** that problem has caused you **DURING THE PAST WEEK.**
(Check one box on each line)

	None (1)	A little bit (2)	Moderate (3)	Quite a bit (4)	Extreme (5)
rr. Feeling weak in parts of your body	❐	❐	❐	❐	❐
ss. Feeling tense or keyed up	❐	❐	❐	❐	❐
tt. Thoughts of death or dying	❐	❐	❐	❐	❐
uu. Having urges to beat, injure or harm someone	❐	❐	❐	❐	❐
vv. Sleep that is restless or disturbed	❐	❐	❐	❐	❐
ww. Having urges to break or smash things	❐	❐	❐	❐	❐
xx. Feeling very self-conscious with others	❐	❐	❐	❐	❐
yy. Feeling uneasy in crowds	❐	❐	❐	❐	❐
zz. Never feeling close to another person	❐	❐	❐	❐	❐
aaa. Spells of terror or panic	❐	❐	❐	❐	❐
bbb. Getting into frequent arguments	❐	❐	❐	❐	❐
ccc. Feeling nervous when your are alone	❐	❐	❐	❐	❐
ddd. Others not giving you proper credit for your achievements	❐	❐	❐	❐	❐
eee. Feeling so restless you couldn't sit still	❐	❐	❐	❐	❐
fff. Feeling of worthlessness	❐	❐	❐	❐	❐
ggg. Feeling that people will take advantage of you if you let them	❐	❐	❐	❐	❐
hhh. Thoughts and images of a frightening nature	❐	❐	❐	❐	❐
iii. Feelings of guilt	❐	❐	❐	❐	❐
jjj. The idea that something is wrong with your mind	❐	❐	❐	❐	❐
kkk. Spending less time with peers and friends	❐	❐	❐	❐	❐

53. —*Continued*— Below is a list of problems and complaints that people sometimes have. Read each one carefully, and select the box that best describes how much **DISCOMFORT** that problem has caused you **DURING THE PAST WEEK.** *(Check one box on each line)*	None (1)	A little bit (2)	Moderate (3)	Quite a bit (4)	Extreme (5)
w. Worrying too much about things	☐	☐	☐	☐	☐
x. Feeling no interest in things	☐	☐	☐	☐	☐
y. Feeling fearful	☐	☐	☐	☐	☐
z. Your feelings are easily hurt	☐	☐	☐	☐	☐
aa. Feeling others do not understand you or are unsympathetic	☐	☐	☐	☐	☐
bb. Feeling that people are unfriendly or dislike you	☐	☐	☐	☐	☐
cc. Feeling inferior to others	☐	☐	☐	☐	☐
dd. Nausea or upset stomach	☐	☐	☐	☐	☐
ee. Feeling that you are watched or talked about by others	☐	☐	☐	☐	☐
ff. Trouble falling asleep	☐	☐	☐	☐	☐
gg. Having to check and double-check what you do	☐	☐	☐	☐	☐
hh. Difficulty making decisions	☐	☐	☐	☐	☐
ii. Feeling afraid to travel	☐	☐	☐	☐	☐
jj. Trouble getting your breath	☐	☐	☐	☐	☐
kk. Hot or cold spells	☐	☐	☐	☐	☐
ll. Having to avoid certain things, places or activities because they frighten you	☐	☐	☐	☐	☐
mm. Your mind going blank	☐	☐	☐	☐	☐
nn. Numbness or tingling in parts of your body	☐	☐	☐	☐	☐
oo. The idea that you should be punished for your sins	☐	☐	☐	☐	☐
pp. Feeling hopeless about the future	☐	☐	☐	☐	☐
qq. Trouble concentrating	☐	☐	☐	☐	☐

MILITARY HISTORY

54. Did you serve in any of the following areas?

(Please check "no" or "yes" on each line. If yes, please check whether you were aboard ship, ashore, or both.)

Area	Did you serve in this area? No (1)	Did you serve in this area? Yes (2)	Were you aboard ship or ashore? (Check both boxes if both) Aboard ship (1)	Were you aboard ship or ashore? (Check both boxes if both) Ashore (2)
a. Persian Gulf—Operation Desert *Shield*	❐	❐	❐	❐
b. Persian Gulf—Operation Desert *Storm*	❐	❐	❐	❐
c. Somalia—Operation Restore Hope	❐	❐	❐	❐
d. Bangladesh	❐	❐	❐	❐
e. Haiti	❐	❐	❐	❐
f. Other foreign area *(Please specify)*:	❐	❐	❐	❐

CASUALTY EVENTS

Witnessing a disaster or violence can sometimes have long-term effects. The following questions will help to provide a baseline of history of exposure to disasters or violence that may help in studying the effects of combat.

55. Have you ever participated in a real mass casualty or a real disaster involving 5 or more major injuries or fatalities?
(Check one box)

1 ❐ No
2 ❐ Yes

(Please describe your participation and events)

When: _____

Where: _____

What happened: _____

Your role: _____

55. —*Continued*— Have you ever participated in a real mass casualty or a real disaster involving 5 or more major injuries or fatalities?

a. What was your official status at the time you participated in this event? *(Check one box)*

1 ☐ Active-duty military
2 ☐ Civilian
9 ☐ Other (*Please describe)*:_____

b. Have you ever seen a person die by violent means? *(Check one box)*

1 ☐ No
2 ☐ Yes *(Please describe your participation and events)*

When: _____

Where: _____

What happened: _____

Your role: _____

WOMEN'S SECTION

HEALTH CONDITIONS (WOMEN)

56. Reproductive system health

Condition	a. Did you have this condition in the **past 90 days**? *(Check one box on each line)*			b. If yes, did you first notice the condition, or did it get worse, **since you came aboard this ship**? *(Check one box on each line if answer to the condition is "yes")*		
	No (1)	Yes (2)	Not sure (9)	First noticed (1)	Got worse (2)	Not sure (9)
a. Bleeding between periods	☐	☐	☐	☐	☐	☐
b. Cramps or pain during menstrual period requiring medication or time off work	☐	☐	☐	☐	☐	☐
c. Excessive frequency of periods (time between periods too short)	☐	☐	☐	☐	☐	☐
d. Heavy periods (excessive menstrual flow)	☐	☐	☐	☐	☐	☐
e. Period lasting longer than 1 week	☐	☐	☐	☐	☐	☐
f. Scanty menstrual flow	☐	☐	☐	☐	☐	☐
g. Abdominal pain (from known cysts)	☐	☐	☐	☐	☐	☐
h. Abdominal pain (from known endometriosis)	☐	☐	☐	☐	☐	☐
i. Abdominal pain (from other or unknown cause) *(Specify:)*	☐	☐	☐	☐	☐	☐
j. Discharge from breast	☐	☐	☐	☐	☐	☐
k. Breast lump	☐	☐	☐	☐	☐	☐
l. Other symptoms related to menstrual period *(Specify:)*	☐	☐	☐	☐	☐	☐

57. Did any of the conditions listed above (a through l) require you to:

a. Take 2 or more hours off from work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

58. During the **past 12 months** have you had regular menstrual periods? *(Check one box)*

1 ☐ No
(Please explain:_____

_____

2 ☐ Yes, about 1 per month.
3 ☐ Yes, but not 1 per month.
(Please explain:_____

_____

If you missed one or more periods during the past 12 months, please check one box below:

1 ☐ I missed my period approximately ____ ____ time(s) during the **past 12 months.**
0 ☐ I had no periods at all during the **past 12 months.**
9 ☐ I'm not sure of the number of periods I missed during the **past 12 months.**

59. During the **past 90 days** have you taken birth control pills to regulate your period? *(Check one box)*

1 ☐ No 2 ☐ Yes

60. During the **past 90 days** have you taken replacement estrogens? *(Check one box)*

1 ☐ No
2 ☐ Yes, hormone pills
3 ☐ Yes, hormone creams or other hormone preparations

61. Did you have any of these during **past 90 days**? *(Please check either "no" or "yes" for every condition listed)*

a. 1 ☐ No 2 ☐ Yes Urinary tract infection
b. 1 ☐ No 2 ☐ Yes Vaginal rash, discharge, or other vaginal disorder except yeast infection, not including sexually transmitted diseases
c. 1 ☐ No 2 ☐ Yes Yeast infection
d. 1 ☐ No 2 ☐ Yes Pelvic or lower abdominal pain
e. 1 ☐ No 2 ☐ Yes Gonorrhea
f. 1 ☐ No 2 ☐ Yes Other sexually-transmitted disease
g. 1 ☐ No 2 ☐ Yes Other genitourinary system condition
*(Please specify):*_____

62. Did any of the conditions listed above (a through g) require you to:

a. Take 2 or more hours off from work during the **past 90 days**? *(Check one box)*

1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**? *(Check one box)*

1 ☐ No 2 ☐ Yes

63. Has a doctor *ever* told you that you had any of the following?

(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Abnormal Pap smear (test for cervical cancer)	☐	☐	____ ____
b. Breast lump diagnosed as benign breast cyst or fibrocystic disease *(Please specify):*	☐	☐	____ ____
c. Benign breast lump, exact diagnosis unknown	☐	☐	____ ____
d. Breast cancer	☐	☐	____ ____

PREGNANCY HISTORY

64. How many times have you been pregnant? *(Check one box)*

0 ☐ Never *(Please skip to question 62)*
1 ☐ I have been pregnant _____ _____ times.

65. Have you been pregnant during the **past 12 months**? *(Check one box)*

1 ☐ No
2 ☐ Yes

66. Are you pregnant now? *(Check one box)*

1 ☐ No
2 ☐ Yes
3 ☐ Not sure

67. How many babies (live births) have you had?
(Fill in one circle)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ or more

68. What is your best estimate of the likelihood that you will become pregnant in the **next 12 months**?

*(Fill in a number between 0 and 100, with 0 representing **no chance** that the event will occur, and 100 representing that the event definitely will occur):*

____ ____ ____ percent

69. Please provide the following information in chronological order. For multiple outcomes, make each a separate entry (e.g., two entries for twins). Indicate only one "outcome" per pregnancy. If you are uncertain of a detail, provide your best estimate.

Pregnancy

	Outcome	What was the approximate date of this outcome?	Were you in the Navy at the time?	What was your duty station type at the time of: Conception	What was your duty station type at the time of: Outcome	Was this pregnancy planned?
a. Most recent	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
b. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
c. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
d. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
e. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19__ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No

OB/GYN AVAILABILITY

70. During the **past 30 days** the following were readily available to me from this ship's medical department, if I needed them: *(Check one box on each line)*	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	I did not need this item (9)
a. Birth control pills	❐	❐	❐	❐	❐	❐
b. Depo-Provera, Norplant	❐	❐	❐	❐	❐	❐
c. Condoms	❐	❐	❐	❐	❐	❐
d. Diaphragm	❐	❐	❐	❐	❐	❐
e. Pregnancy testing or test kit	❐	❐	❐	❐	❐	❐
f. Family planning information	❐	❐	❐	❐	❐	❐
g. Appropriately staffed and equipped OB/GYN medical support	❐	❐	❐	❐	❐	❐

71. Approximately how many months or days ago was your most recent: *(Fill in number of months or days for each item)*	**Number of months**	**Number of days** *(if less than 1 month)*
a. Pap smear (test for cervical cancer)?	____ ____	____ ____
d. Pelvic examination?	____ ____	____ ____
e. Breast examination by a physician or nurse	____ ____	____ ____

OB/GYN QUESTIONS FOR CURRENTLY DEPLOYED WOMEN

72. Did you request a pre-deployment appointment with a gynecologist or obstetrician from a Navy medical facility prior to this deployment?? *(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")* *(Check one box)*

1 ❐ No *(Please skip to Comments and Suggestions on the last page)*
2 ❐ Yes

73. Were you given a gynecological or obstetrical appointment? *(Check one box)*

1 ❐ No *(Please skip to Comments and Suggestions on the last page)*
2 ❐ Yes

a. Did you keep the appointment? *(Check one box)*

1 ❐ No
2 ❐ Yes

ADDITIONAL COMMENTS AND SUGGESTIONS

Additional comments you would like to add:

Suggestions for topics that should be added, changed, or deleted:

THANK YOU!

Please return to your shipboard coordinator or:

Naval Health Research Center
Code 233
P.O. Box 85122
San Diego CA 92186-5122
Telephone (619) 553-6881; DSN 553-6881

APPENDIX C.5

Survey 90

U.S. Navy Shipboard Health Survey

Naval Health Research Center, San Diego

Information to participants

You are being asked to voluntarily complete this survey giving candid responses and opinions about health-related issues and to become part of a study that will involve one or more additional questionnaires. Your answers are for research use only and will be kept strictly confidential. Data will be reported so that no individual participant can be identified and the information you provide will not become part of anyone's official records. If you have any questions about this survey, please contact Dr. Frank C. Garland, Naval Health Research Center, San Diego, CA 92186-5122/DSN: 553-6881; Commercial (619) 553-6881.

Privacy Act Statement

1. Authority. 5 USC 301, 10 USC 1071. OPNAV Control Symbol 6000-13C **2. Purpose.** Medical research information will be collected to enhance basic medical knowledge concerning medical care and health promotion. **3. Routine use.** Medical research information will be used in statistical analyses by the Departments of the Navy, Defense, and other U.S. Government agencies, provided this is compatible with the purpose for which information was collected. Use of the information may be granted to non-Government agencies by the Chief, Bureau of Medicine and Surgery, in accordance with the provisions of the Freedom of Information Act. **4. Voluntary disclosure.** I understand that all information derived from the study will be retained at the Naval Health Research Center, San Diego, and that my anonymity will be maintained. I voluntarily agree to its disclosure to agencies or individuals identified in the preceding paragraph, and I have been informed that failure to agree to its disclosure to agencies or individuals identified in the preceding paragraph. I understand that my provision of information is voluntary, and that I am free to discontinue filling out the questionnaire and withdraw from the study at any time without prejudice or loss of medical treatment or privileges to which I would otherwise be entitled.

A. Name (please print):

Last First Middle Initial

B. Social security number: ___ ___ ___ -- ___ ___ -- ___ ___ ___ ___

C. Date of birth: Month: ___ ___ Day: ___ ___ Year: 19 ___ ___

Shipboard Form 90 Questionnaire
THIS PAGE IS TO BE COMPLETED BY ALL STUDY PARTICIPANTS AND WILL BE REMOVED BEFORE PROCESSING.
Note: Questionnaires may be distributed by active-duty, reserve, or civilian personnel.
Rev. 7.0 (31 May 95)

Voluntary Consent to Participate in the U.S. Navy Shipboard Health Survey

1. I am being asked to volunteer to participate in a research study titled, "Health Aboard Navy Ships: A Comprehensive Health and Readiness Research Project" The purpose of this study is to enhance basic medical knowledge concerning the provision of medical care and health promotion. I am being asked to participate now, and can expect to receive a follow-up questionnaire in about 1 year if I am still on active duty.

2. I understand that my participation in this study is completely voluntary. If I do not choose to participate there are no penalties, and I will not lose any benefits to which I am otherwise entitled. I may discontinue my participation in this study at any time I choose without fear of penalty or loss of benefits to which I am otherwise entitled.

3. The benefit that I may expect from my participation in this research study is the knowledge that I will be helping the Navy to provide the best possible medical services to men and women serving aboard Navy ships. There is no direct personal benefit to me from participation in this research study.

4. The investigators believe that there are no direct physical or psychological risks to me as a participant in this research study, with the possible exception of a very unlikely accidental breach of confidentiality and loss of anonymity. Specific measures to ensure my anonymity are outlined in paragraph 5.

5. Confidentiality during this research study will be ensured by restricting access to all data collected to personnel working on this research study who have taken an oath of confidentiality. The confidentiality of the information related to my participation in this research study will be ensured at all times by use of an arbitrary number to identify me. I also understand that none of my responses will become a part of my medical or military record and that no information that might identify me personally will be included in results from reports of this study. Thank you! the anonymous portion of this contains no personal identifiers and cannot be linked to me in any way.

6. If I have questions about this research study I should contact the principal investigator, Dr. Frank C. Garland at the Naval Health Research Center (NHRC), San Diego, CA 92186-5122, phone (619) 553-6881; DSN 553-6881. If I have questions about the ethical aspects of this study, my rights as a volunteer, or any concerns relating to protection of research volunteers, I can contact Dr. Tamsin Kelly at NHRC, phone (619) 553-8443; DSN 553-8443. Additionally, I may contact Dr. Lisa Meyer at NHRC if I have any questions about medical aspects of this study. Dr. Meyer may be contacted at NHRC, phone (619) 553-8376; DSN: 553-8376.

7. I have been informed that Dr. Frank C. Garland is responsible for the storage of my consent form and the research records related to my participation in this study. These records are stored at the Naval Health Research Center, San Diego, CA 92186-5122.

8. I have been given an opportunity to ask questions about this study and its related procedures and risks, as well as any of the other information contained in this consent form. All my questions have been answered to my satisfaction. By my signature below, I give my voluntary informed consent to participate in this research study as it has been explained to me and acknowledge receipt of a copy of this form for my own personal records.

_____
(Last name, first name, middle initial)

_____ _____
(Signature) Date (DD/MM/YY)

--This page will be removed and stored separately to protect your confidentiality--

DEMOGRAPHIC DATA

1. Today's date: Month: ____ ____ Day: ____ ____ Year: 199 ___

2. What is your gender?

   1 ☐ Male
   2 ☐ Female

3. What is your age in years? ____ ____ years

4. What is your race? *(Check one box)*

   1 ☐ White, non-Hispanic
   2 ☐ White, Hispanic
   3 ☐ Black/African-American, non-Hispanic
   4 ☐ Black/African-American, Hispanic
   5 ☐ Asian/Pacific Islander
   6 ☐ Native American
   9 ☐ Other *(Please specify):*_____

5. What is the highest level of education you have completed?
   (Check one box)

   1 ☐ Some high school
   2 ☐ Graduate equivalency degree (GED)
   3 ☐ High school graduate
   4 ☐ Trade or technical school graduate
   5 ☐ Some college or AA degree
   6 ☐ 4-year college degree
   7 ☐ Graduate or professional degree

6. Marital status
   a. What is your current marital status?
   (Check one box)

   1 ☐ Never married
   2 ☐ Married *(Please skip to question 7)*
   3 ☐ Separated
   4 ☐ Divorced
   5 ☐ Widowed

   b. Do you plan to marry during the **next 12 months**?
   (Check one box)

   1 ☐ No
   2 ☐ Yes
   3 ☐ Don't know

7. What is your paygrade? *(Circle one)*

Enlisted		Warrant officer	Officer	
E-1	E-6	W-1	O-1	O-6
E-2	E-7	W-2	O-2	
E-3	E-8	W-3	O-3	
E-4	E-9	W-4	O-4	
E-5			O-5	

8. If you are Navy enlisted, what is your rating (e.g., SN, FN, BT, HM, ASM)? ___ ___ ___

9. If you are Marine enlisted, what is your M.O.S. number? ____ ____ ____ ____

10. What is your total number of years on active duty? ____ ____ years

11. Times aboard ship(s)

    a. What is the approximate total time you have served aboard ship counting all time on **all** ships on which you have served?
    _____ _____ years and _____ _____ months

    b. What is the approximate total time time you served aboard this ship?
    _____ _____ years and _____ _____ months

12. Where do you live when your ship is in your home port?
(Check one box)

    1 ☐ Aboard ship
    2 ☐ Navy Housing
    3 ☐ BEQ/BOQ
    9 ☐ Other

13. To what ship (or command) are you currently assigned? _____

14. If you are currently aboard ship, what is your ship's current status?
*(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")*
(Check one box)

    1 ☐ In home port
    2 ☐ At sea
    3 ☐ In port other than home port
    4 ☐ In shipyard
    9 ☐ Other *(Please specify)*:_____

15. Are you currently deployed (**30 days or more**)?
(Check one box)

    1 ☐ No *(Please skip to question 18)*
    2 ☐ Yes

16. What date did you begin this deployment? Mo.:____ ____ Day: ____ ____ Year: 199___

17. If you are out of your home port, what is the expected length of time between today and the date you return to your home port?
(Check one box)

1 ☐ Less than 1 week
2 ☐ 1 week to less than 1 month
3 ☐ 1 month to less than 3 months
4 ☐ 3 months to less than 6 months
5 ☐ 6 months to less than 12 months
6 ☐ 12 months to less than 18 months
7 ☐ 18 months or longer

18. How many times have you deployed aboard Navy ships (**30 days or more**), not counting present deployment? *(Check one box)*

0 ☐ Never ☐ ____ ____ times

HEALTH CONDITIONS

This section is to report all conditions that you had during the **past 30 days** regardless of **whether or not** they resulted in a visit to sick call or a health care provider.

19. Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

a.	1☐ No	2☐ Yes	Common cold symptoms
b.	1☐ No	2☐ Yes	Dizziness
c.	1☐ No	2☐ Yes	Chills
d.	1☐ No	2☐ Yes	Cough
e.	1☐ No	2☐ Yes	Sore throat
f.	1☐ No	2☐ Yes	Fever
g.	1☐ No	2☐ Yes	Flu
h.	1☐ No	2☐ Yes	Diarrhea lasting **at least 3 days**
i.	1☐ No	2☐ Yes	Stomach problems
j.	1☐ No	2☐ Yes	Constipation
k.	1☐ No	2☐ Yes	Indigestion
l.	1☐ No	2☐ Yes	Nausea/vomiting
m.	1☐ No	2☐ Yes	Sinus trouble
n.	1☐ No	2☐ Yes	Hay fever
o.	1☐ No	2☐ Yes	Shortness of breath
p.	1☐ No	2☐ Yes	Hoarseness
q.	1☐ No	2☐ Yes	Skin problems
r.	1☐ No	2☐ Yes	Muscle sprain or strain
s.	1☐ No	2☐ Yes	Back problems
t.	1☐ No	2☐ Yes	Hearing problems
u.	1☐ No	2☐ Yes	Irritated eyes
v.	1☐ No	2☐ Yes	Trouble seeing with one or both eyes even if wearing glasses or contacts

19. — *Continued*— Have you had any of these health conditions during the **past 30 days whether or not** it resulted in a visit to sick call or a health care provider ?
(Please check either "no" or "yes" for every condition)

w. 1☐ No 2☐ Yes Pain in stomach or abdominal area
x. 1☐ No 2☐ Yes Heat stress or heat stroke
y. 1☐ No 2☐ Yes Headache:
If yes, was it accompanied by: *(Please check either "no" or "yes" for every condition)*
1☐ No 2☐ Yes Visual disturbances
1☐ No 2☐ Yes Numbness or tingling
1☐ No 2☐ Yes Sensitivity to noise
1☐ No 2☐ Yes Sensitivity to light
1☐ No 2☐ Yes Nausea
z. 1☐ No 2☐ Yes Psychological condition(s) or personal problem(s) severe enough to interfere with daily activities
aa. 1☐ No 2☐ Yes Other condition or injury
Please specify : _____
bb. 1☐ No 2☐ Yes *(Women)* Menstrual conditions (premenstrual syndrome, menstrual cramps, irregular or absent periods)

20. During the **past 30 days:**

a. Did you receive a doctor's diagnosis of any of these from a health care provider not on this ship ?
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Cold or acute nasopharyngitis
2. 1☐ No 2☐ Yes Sore throat, viral
3. 1☐ No 2☐ Yes Cough, viral
4. 1☐ No 2☐ Yes Flu

b. Have you been unable to perform your military duties for 1 or more days because of the reasons below?
(Please check either "no" or "yes" for every condition)

1. 1☐ No 2☐ Yes Health problem
2. 1☐ No 2☐ Yes Emotional problem
3. 1☐ No 2☐ Yes Personal problem
4. 1☐ No 2☐ Yes Family problem
5 1☐ No 2☐ Yes Other *(Please specify :)* _____

_____

_____

MEDICAL HISTORY

21. Has a doctor *ever* told you that you had any of the following? *(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)*	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Asthma	❒	❒	____ ____
b. Migraine headache	❒	❒	____ ____
c. Anemia	❒	❒	____ ____
d. Depression	❒	❒	____ ____
e. Gonorrhea	❒	❒	____ ____
f. Syphilis	❒	❒	____ ____
g. Chlamydia	❒	❒	____ ____
h. Urinary tract infection	❒	❒	____ ____
i. Kidney infection	❒	❒	____ ____
j. Hernia (other than hiatal)	❒	❒	____ ____

RECENT MEDICAL CARE

22. Approximately how many months or days ago was your: *(Fill in number of months or days for each item)*	Number of months	Number of days *(if less than 1 month)*
a. Most recent visit to a medical doctor?	____ ____	____ ____
b. Most recent visit to another health care professional? *(Please specify type of provider, e.g., psychologist, dentist, nurse-practitioner)*:	____ ____	____ ____
c. Most recent visit to a hospital corpsman?	____ ____	____ ____

23. If you are currently deployed (**30 days or more**), were you medically screened preceding this deployment?
(Check one box)

1 ❒ No
2 ❒ Yes
9 ❒ Not applicable, since I am not currently deployed.

24. In what month and year were you last screened? Month: _____ _____ Year: 199 ____

OCCUPATIONAL EXPOSURES

25. Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	Past 30 days: No. of days exposed per week	Past 36 months: No. of days exposed per week	Past 36 months: Total no. of mos. exposed
a. Adhesives or gluing compounds	☐	☐	☐				
b. Asbestos (loose)	☐	☐	☐				
c. Carbon monoxide	☐	☐	☐				
d. Diesel exhaust within 50 feet	☐	☐	☐				
e. Diesel fuel within 50 feet	☐	☐	☐				
f. Dry cleaning solvent	☐	☐	☐				
g. Exhaust from gasoline engine	☐	☐	☐				
h. Gasoline (liquid or vapor)	☐	☐	☐				
i. Guided missile fuel	☐	☐	☐				
j. High temperature (above 95°F)	☐	☐	☐				
k. Hypodermic needles (used)	☐	☐	☐				
l. Insecticides	☐	☐	☐				
m. Jet exhaust within 50 feet	☐	☐	☐				
n. Jet fuel within 50 feet	☐	☐	☐				
o. Lifting 25 - 49 pounds	☐	☐	☐				
p. Lifting 50 or more pounds	☐	☐	☐				
q. Loud noise (such as jets)	☐	☐	☐				
r. Low temperature (below 32° F)	☐	☐	☐				
s. Metal scrapings or filings	☐	☐	☐				
t. Microwave oven within 3 feet	☐	☐	☐				
u. Paint (oil based), or thinner	☐	☐	☐				
v. Paint, other or unknown type	☐	☐	☐				
w. Paint scrapings or paint sanding	☐	☐	☐				
x. Radar antenna or array within 50 feet	☐	☐	☐				
y. Solvent or degreaser	☐	☐	☐				
z. Torpedo fuel	☐	☐	☐				

25. —*Continued*—Have you been exposed to any of the factors listed below?

Exposure *(Check one box on each line. If you answer "yes" to any question, please complete all items on that line.)*	No (1)	Yes (2)	Not sure (9)	If yes: During the Past 30 days: No. of hours exposed per day	If yes: During the Past 30 days: No. of days exposed per week	If yes: During the Past 36 months: No. of days exposed per week	If yes: During the Past 36 months: Total no. of mos. exposed
aa. Other chemicals *(Please specify):*	☐	☐	☐				
bb. Transmitting antennas within 50 feet	☐	☐	☐				
cc. Nuclear reactor within 50 feet	☐	☐	☐				
dd. Nuclear fuel within 50 feet	☐	☐	☐				
ee. Nuclear ordnance within 50 feet	☐	☐	☐				
ff. Nuclear medicines (radioisotopes)	☐	☐	☐				
gg. Video display terminal (VDT, CRT)	☐	☐	☐				
hh. Welding fumes	☐	☐	☐				
ii. Dust or particles	☐	☐	☐				
jj. Explosives (nonnuclear) within 50 feet	☐	☐	☐				
kk. Nitrous oxide	☐	☐	☐				
ll. Ethylene dibromide (EDB)	☐	☐	☐				
mm. Perchlorethylene (PERC)	☐	☐	☐				
nn. Anthrax vaccine	☐	☐	☐	Year first received 19 ___ ___		Year last received 19 ___ ___	
oo. Antimalaria pills	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
pp. Pyridostigmine	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	
qq. Other anti-CBW pills or agents *(Please specify):*	☐	☐	☐	Year first taken 19 ___ ___		Year last taken 19 ___ ___	

PROTECTIVE GEAR

26. Is protective gear available for use in your current job?
(Please check one box in each of the four columns)

Item	Is this item available?			Does it fit you properly?			Do you wear it when needed?			Does it seriously interfere with your ability to do your work?		
	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)	No (1)	Yes (2)	Some-times (3)
a. Gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b. Respirator or mask	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c. Protective gloves	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d. Boots	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e. Ear plugs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f. Film badges	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g. Hazardous materials suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h. Fire fighting suit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

LIFESTYLE

27. Have you smoked at least 100 cigarettes in **your entire life**? *(Check one box)*

1 ☐ No *(Please skip to question 30)*
2 ☐ Yes

28. On how many of the **past 30 days** did you smoke cigarettes? *(Check one box)*

0 ☐ None
1 ☐ 1-4 days
2 ☐ 5-9 days
3 ☐ 10-14 days
4 ☐ 15-19 days
5 ☐ 20-24 days
6 ☐ 25-29 days
7 ☐ Every day
9 ☐ Not sure

29. On average, about how many cigarettes did you smoke per day during the **past 30 days**? *(Check one box)*

0 ☐ None
1 ☐ Fewer than 1 cigarette a day, on the average
2 ☐ 1-4 cigarettes
3 ☐ 5-9 cigarettes
4 ☐ 10-19 cigarettes
5 ☐ 20-29 cigarettes
6 ☐ 30-39 cigarettes
7 ☐ 40-49 cigarettes
8 ☐ 50 or more cigarettes
9 ☐ Not sure

30. **1 year from now**, how do you see yourself with regard to cigarette smoking? *(Check one box)*

1 ☐ Definitely a non-smoker
2 ☐ Probably a non-smoker
3 ☐ Maybe a smoker, maybe not
4 ☐ Probably a smoker
5 ☐ Definitely a smoker

31. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your immediate work area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

32. During the **past 30 days**, have you been exposed to tobacco smoke for 1 hour or more per day in your sleeping area or other non-working area? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Not sure

33. Sleeping area

a. Approximately how many people occupy your sleeping quarters aboard ship when you are sleeping (not counting yourself)?

_____ _____ _____ people

b. Where is your bunk/bed?

Deck or floor designation: _____

Room or compartment number: _____

34. Working area

a. Approximately how many people occupy your work area when you are working?

_____ _____ _____ people

b. Where is your work area?

Deck or floor designation: _____

Room or compartment number: _____

Multiple areas *(Please specify areas)*: _____

35. During the **past 7 days**, on how many days did you have any alcoholic beverages? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦

(If 0, please skip to question 38)

36. On the days you drank any alcoholic beverage during the **past 7 days**, how many drinks did you usually have per day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no._____ _____

37. During the **past 7 days**,what was the largest number of alcoholic drinks you had in 1 day? (Consider a single shot, single mixed drink, glass of wine, or can of beer as 1 drink.) *(Fill in one circle)*

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ More, please give no. _____ _____

38. *(Unmarried men and women)* When you are ashore, do you live with a significant other person in a marital-like relationship? *(Check one box)*

1 ☐ No
2 ☐ Yes
9 ☐ Don't know

39. My current: a. Weight is _____ _____ _____ pounds

b. Height is _____ feet and _____ _____ inches

HEALTH CARE

Please help us to further evaluate the Navy's health care program by answering some questions about the services you have received at sick call. We are interested in your honest opinions, whether they are positive or negative.

40. How many weeks have you been at your present duty station? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ or more

41. How many times have you been to sick call for medical care in the **past 3 months**? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ or more

42. Where do you usually go for medical care? *(Check one box)*

❒ 1 A civilian doctor
❒ 2 Navy sick call *(Specify)*: _____
❒ 3 Other *(Specify)*: _____

43. How many prescriptions have you received at sick call in the **past 3 months**? *(Fill in one circle)*

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ or more

44. When you go to sick call who is the primary person who treats you? *(Check one box)*

❒ 1 Doctor
❒ 2 Physician's Assistant
❒ 3 Corpsman
❒ 4 Other *(Specify)*: _____

45. Which of the following have you been treated by (gave you a diagnosis, a prescription, talked to you about your problem) at sick call in the **past 3 months**? *(Check one box)*

❒ 1 Doctor
❒ 2 Physician's Assistant
❒ 3 Corpsman
❒ 4 Other *(Specify)*: _____

46. Where did you receive your last performance evaluation (or fitness report)? *(Check one box)*

❒ 1 Present command
❒ 2 Previous command
❒ 3 Other *(Specify)*: _____

47. If you are enlisted what was your overall performance evaluation mark on your last evaluation report?
(Check one box)

- ❒ 1.0
- ❒ 2.0
- ❒ 2.6
- ❒ 2.8
- ❒ 3.0
- ❒ 3.2
- ❒ 3.4
- ❒ 3.6
- ❒ 3.8
- ❒ 4.0

48. If you are an officer, what was your ranking among your peer group on your last officer fitness report?

I was number _____ out of _____.

MOOD ASSESSMENT I

The next questions are about how you feel and how things have been with you within the **past month.**

49. For each question, please check the box for the one answer that comes closest to the way you have been feeling.

(Check one box on each line)	Always (1)	Very often (2)	Fairly often (3)	Some-times (4)	Almost never (5)	Never (6)
a. How often did you become nervous or jumpy when faced with excitement or unexpected situations, during the past month?	☐	☐	☐	☐	☐	☐
b. When you got up in the morning, this past month, about how often did you expect to have an interesting day?	☐	☐	☐	☐	☐	☐
c. During the past month, how often did your hands shake when you tried to do something?	☐	☐	☐	☐	☐	☐
d. During the past month, how often did you feel that you had nothing to look forward to?	☐	☐	☐	☐	☐	☐
e. How often have you felt like crying, during the past month?	☐	☐	☐	☐	☐	☐
f. During the past month, how often did you feel that others would be better off if you were dead?	☐	☐	☐	☐	☐	☐
g. How often, during the past month, did you feel that nothing turned out for you the way you wanted it to?	☐	☐	☐	☐	☐	☐
h. How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?	☐	☐	☐	☐	☐	☐
i. During the past month, how often did you get rattled, upset, or flustered?	☐	☐	☐	☐	☐	☐
j. How often, during the past month, did you find yourself having difficulty trying to calm down?	☐	☐	☐	☐	☐	☐

MOOD ASSESSMENT II

The next questions also are about how you feel and how things have been with you within the **past month.**

50. For each question, please check the box for the one answer that comes closest to the way you have been feeling.

(Check one box on each line)	All of the time (1)	Most of the time (2)	A good bit of the time (3)	Some of the time (4)	A little of the time (5)	None of the time (6)
a. How much of the time have you felt lonely, during the past month?	☐	☐	☐	☐	☐	☐
b. During the past month, how much of the time have you felt that the future looks hopeful and promising?	☐	☐	☐	☐	☐	☐
c. How much of the time, during the past month, has your daily life been full of things that were interesting to you?	☐	☐	☐	☐	☐	☐
d. How much of the time, during the past month, did you feel relaxed and free of tension?	☐	☐	☐	☐	☐	☐
e. During the past month, how much of the time have you generally enjoyed the things you do?	☐	☐	☐	☐	☐	☐
f. During the past month, how much of the time have you felt loved and wanted?	☐	☐	☐	☐	☐	☐
g. How much of the time, during the past month, have you been a very nervous person?	☐	☐	☐	☐	☐	☐
h. During the past month, how much of the time have you felt tense or "high-strung?"	☐	☐	☐	☐	☐	☐
i. How much of the time, during the past month, have you felt calm and peaceful?	☐	☐	☐	☐	☐	☐
j. How much of the time, during the past month, have you felt emotionally stable?	☐	☐	☐	☐	☐	☐
k. How much of the time, during the past month, have you felt downhearted and blue?	☐	☐	☐	☐	☐	☐
l. How much of the time, during the past month, were you able to relax without difficulty?	☐	☐	☐	☐	☐	☐

50. —*Continued*— For each question, please check the box for the one answer that comes closest to the way you have been feeling.

(Check one box on each line)	All of the time (1)	Most of the time (2)	A good bit of the time (3)	Some of the time (4)	A little of the time (5)	None of the time (6)
m. During the past month, how much of the time did you feel that your love relationships, loving and being loved, were full and complete?	❐	❐	❐	❐	❐	❐
n. During the past month, how much of the time has living been a wonderful adventure for you?	❐	❐	❐	❐	❐	❐
o. During the past month, how much of the time have you felt restless, fidgety, or impatient?	❐	❐	❐	❐	❐	❐
p. During the past month, how much of the time have you been moody or brooded about things?	❐	❐	❐	❐	❐	❐
q. How much of the time, during the past month, have you felt cheerful, lighthearted?	❐	❐	❐	❐	❐	❐
r. During the past month, how much of the time were you a happy person?	❐	❐	❐	❐	❐	❐
s. During the past month, how much of the time have you been in low or very low spirits?	❐	❐	❐	❐	❐	❐

MOOD ASSESSMENT III

51. How happy, satisfied, or pleased have you been with your personal life during the **past month**? *(Circle one)*

Extremely happy, could not have been more satisfied or pleased.....1
Very happy most of the time 2
Generally satisfied, pleased.....3
Sometimes fairly satisfied, sometimes fairly unhappy.....4
Generally dissatisfied, unhappy.....5
Very dissatisfied, unhappy most of the time.....6

52. How often do you eat too much? *(Circle one)*

Very often.....1
Fairly often.....2
Sometimes.....3
Almost never.....4
Never.....5

53. During the **past month**, have you had any reason to wonder if you were losing your mind, or losing control over the way you act, talk, think, feel, or of your memory?
(Circle one)

No, not at all.....1
Maybe a little.....2
Yes, but not enough to be concerned or worried about it.....3
Yes, and I have been a little concerned.....4
Yes, and I am quite concerned..... 5
Yes, and I am very much concerned about it.....6

54. Did you feel depressed during the **past month**?
(Circle one)

Yes, to the point that I did not care about anything for days at a time.....1
Yes, very depressed almost every day.....2
Yes, quite depressed several times.....3
Yes, a little depressed now and then.....4
No, never felt depressed at all.....5

55. How often have there been times in your life when you felt you acted like a coward?
(Circle one)

Very often.....1
Fairly often.....2
Sometimes.....3
Almost never.....4
Never.....5

56. During the **past month**, have you been in firm control of your behavior, thoughts, emotions, feelings?
(Circle one)

Yes, very definitely.....1
Yes, for the most part.....2
Yes, I guess so.....3
No, not too well.....4
No, and I am somewhat disturbed.....5
No, and I am very disturbed.....6

57. Would you say that you give every penny you can to charity?
(Circle one)

Yes, definitely.....1
Yes, for the most part.....2
Yes, I try.....3
No.....4

58. In choosing your friends, how important to you are things like their race, their religion, or their political beliefs?
(Circle one)

Always very important.....1
Almost always important.....2
Usually important 3
Not too important 4
Hardly ever important 5
Not important at all.....6

59. How much have you been bothered by nervousness, or your "nerves," during the **past month**? *(Circle one)*

Extremely so, to the point where I could not take care of things.....1
Very much bothered.....2
Bothered quite a bit by nerves.....3
Bothered some, enough to notice.....4
Bothered just a little by nerves.....5
Not bothered at all by this.....6

60. If it is more convenient for you to do so, how often will you tell a lie?
(Circle one)

Very often tell a lie.....1
Fairly often..... 2
Sometimes tell a lie.....3
Almost never.....4
Never tell a lie.....5

61. During the past month, did you ever think about taking your own life?
(Circle one)

Yes, very often.....1
Yes, fairly often.....2
Yes, a couple of times.....3
Yes, at one time.....4
No, never.....5

62. Are your table manners at home just as good as they are when you are invited out to dinner?
(Circle one)

Yes, always just as good.....1
Yes, with rare exceptions.....2
Yes, usually just as good.....3
No, usually worse at home.....4
No, quite a bit worse at home.....5
No, very bad at home.....6

63. During the **past month**, have you been anxious or worried?
(Circle one)

Yes, extremely so, to the point of being sick or almost sick.....1
Yes, very much so.....2
Yes, quite a bit.....3
Yes, some, enough to bother me.....4
Yes, a little bit.....5
No, not at all.....6

64. How often, during the **past month**, have you been waking up feeling fresh and rested?
(Circle one)

Always, every day.....1
Almost every day.....2
Most days.....3
Some days, but usually not.....4
Hardly ever.....5
Never wake up feeling rested.....6

65. During the **past month**, have you been under or felt you were under any strain, stress, or pressure?
(Circle one)

Yes, almost more than I could stand or bear.....1
Yes, quite a bit of pressure.....2
Yes, some, more than usual.....3
Yes, some, but about normal.....4
Yes, a little bit..... 5
No, not at all.....6

YOUR HEALTH

66. Please read each of the following statements, and then check one of the boxes to indicate your opinion about your health.

a. In general, would you say that your health is excellent, good, fair, or poor?
(Check one)

❒ 1 Excellent ❒ 2 Good ❒ 3 Fair ❒ 4 Poor

b. During the **past 3 months**, how much pain have you had?
(Check one)

❒ 1 A great deal of pain ❒ 2 Some pain ❒ 3 A little pain ❒ 4 No pain at all

c. During the **past 3 months**, how much has your health worried or concerned you?
(Check one)

❒ 1 A great deal ❒ 2 Somewhat ❒ 3 A little ❒ 4 Not at all

67. Please read each of the following statements, and then check one of the boxes to indicate whether the statement is true or false for you. There are no right or wrong answers. Some of the statements may look or seem like others but each statement should be rated by itself.

(Check one box on each line)	Definitely false (1)	Mostly false (2)	Don't know (3)	Mostly true (4)	Definitely true (5)
a. According to doctors (or corpsmen) I've seen, my health is now excellent.	❐	❐	❐	❐	❐
b. I seem to get sick a little easier than other people.	❐	❐	❐	❐	❐
c. I feel better now than I ever have before.	❐	❐	❐	❐	❐
d. I will probably be sick a lot in the future.	❐	❐	❐	❐	❐
e. I never worry about my health.	❐	❐	❐	❐	❐
f. Most people get sick a little easier than I do.	❐	❐	❐	❐	❐
g. I am somewhat ill.	❐	❐	❐	❐	❐
h. In the future, I expect to have better health than other people I know.	❐	❐	❐	❐	❐
i. I was so sick once I thought I might die.	❐	❐	❐	❐	❐
j. I'm not as healthy now as I used to be.	❐	❐	❐	❐	❐
k. I worry about my health more than other people worry about their health.	❐	❐	❐	❐	❐
l. My body seems to resist illness very well.	❐	❐	❐	❐	❐
m. Getting sick once in a while is a part of my life.	❐	❐	❐	❐	❐
n. I'm as healthy as anybody I know.	❐	❐	❐	❐	❐
o. I think my health will be worse in the future than it is now.	❐	❐	❐	❐	❐
p. I've never had an illness that lasted a long period of time.	❐	❐	❐	❐	❐
q. Others seem more concerned about their health than I am about mine.	❐	❐	❐	❐	❐
r. My health is excellent.	❐	❐	❐	❐	❐

67. —*Continued*— Please read each of the following statements, and then check one of the boxes to indicate whether the statement is true or false for you. There are no right or wrong answers. Some of the statements may look or seem like others but each statement should be rated by itself.

(Check one box on each line)	Definitely false (1)	Mostly false (2)	Don't know (3)	Mostly true (4)	Definitely true (5)
s. I expect to have a very healthy life.	❐	❐	❐	❐	❐
t. My health is a concern in my life.	❐	❐	❐	❐	❐
u. I accept that sometimes I'm just going to be sick.	❐	❐	❐	❐	❐
v. I have been feeling bad lately.	❐	❐	❐	❐	❐
w. I have never been seriously ill.	❐	❐	❐	❐	❐
x. When there is something going around, I usually catch it.	❐	❐	❐	❐	❐
y. Doctors (or corpsmen) say that I am now in poor health.	❐	❐	❐	❐	❐
z. I feel about as good now as I ever have.	❐	❐	❐	❐	❐

PATIENT SATISFACTION I

68. Please take a moment to recall your visit(s) to sick call. Then check the one box that describes the strength of your agreement or disagreement with the following statements.

(Check one box on each line)	Very strongly agree (1)	(2)	(3)	(4)	(5)	(6)	Very strongly disagree (7)
a. The doctor (or corpsman) gave a poor explanation of my illness.	☐	☐	☐	☐	☐	☐	☐
b. The doctor (or corpsman) told me just what my trouble is.	☐	☐	☐	☐	☐	☐	☐
c. After talking with the doctor (or corpsman), I knew just how serious my illness is.	☐	☐	☐	☐	☐	☐	☐
d. The doctor (or corpsman) told me all I wanted to know about my illness.	☐	☐	☐	☐	☐	☐	☐
e. I was not really certain about how to follow the doctor's (or corpsman's) advice.	☐	☐	☐	☐	☐	☐	☐
f. After talking with the doctor (or corpsman), I had a good idea of how long it would be before I would be well again.	☐	☐	☐	☐	☐	☐	☐
g. The doctor (or corpsman) seemed interested in me as a person.	☐	☐	☐	☐	☐	☐	☐
h. The doctor (or corpsman) seemed warm and friendly to me.	☐	☐	☐	☐	☐	☐	☐
i. I felt that the doctor (or corpsman) did not treat me as an equal.	☐	☐	☐	☐	☐	☐	☐
j. The doctor (or corpsman) seemed to take my problems seriously.	☐	☐	☐	☐	☐	☐	☐
k. I felt embarrassed while talking with the doctor (or corpsman).	☐	☐	☐	☐	☐	☐	☐
l. I felt free to talk with the doctor (or corpsman) about private matters.	☐	☐	☐	☐	☐	☐	☐
m. The doctor (or corpsman) gave me a chance to say what was really on my mind.	☐	☐	☐	☐	☐	☐	☐
n. I really felt understood by the doctor (or corpsman).	☐	☐	☐	☐	☐	☐	☐

68. —*Continued*— Please take a moment to recall your visit(s) to sick call. Then check the one box that describes the strength of your agreement or disagreement with the following statements.

(Check one box on each line)	Very strongly agree (1)	(2)	(3)	(4)	(5)	(6)	Very strongly disagree (7)
o. The doctor (or corpsman) did not allow me to say everything I had wanted about my problems.	☐	☐	☐	☐	☐	☐	☐
p. The doctor (or corpsman) did not really understand my main reason for coming.	☐	☐	☐	☐	☐	☐	☐
q. I would trust my life with the doctor (or corpsman) that treated me.	☐	☐	☐	☐	☐	☐	☐
r. I would hesitate to recommend the doctor (or corpsman) I saw to my friends.	☐	☐	☐	☐	☐	☐	☐
s. The doctor (or corpsman) seemed to know what she/he was doing.	☐	☐	☐	☐	☐	☐	☐
t. After talking with the doctor (or corpsman), I felt much better about my problems.	☐	☐	☐	☐	☐	☐	☐
u. The doctor (or corpsman) relieved my worries about my illness.	☐	☐	☐	☐	☐	☐	☐
v. Talking with the doctor (or corpsman) did not at all help my worries about my illness.	☐	☐	☐	☐	☐	☐	☐
w. The doctor (or corpsman) came up with a good plan for helping me.	☐	☐	☐	☐	☐	☐	☐
x. The doctor (or corpsman) visit did not at all help me.	☐	☐	☐	☐	☐	☐	☐
y. The doctor (or corpsman) seemed to know just what to do for my problem.	☐	☐	☐	☐	☐	☐	☐
z. It was easy for me to follow the doctor's (or corpsman's) advice.	☐	☐	☐	☐	☐	☐	☐
aa. I followed the doctor's (or corpsman's) instructions.	☐	☐	☐	☐	☐	☐	☐
bb. It was difficult for me to do exactly what the doctor (or corpsman) told me to do.	☐	☐	☐	☐	☐	☐	☐
cc. I'm not sure the doctor's (or corpsman's) treatment was worth the trouble it took.	☐	☐	☐	☐	☐	☐	☐

PATIENT SATISFACTION III

69. Please help us evaluate your health care program by answering the following questions. Please check only one box for each question.

a. When you first came to sick call, were you seen as promptly as you felt necessary? *(Check one)*

❒ 4 Yes, very promptly ❒ 3 Yes, promptly ❒ 2 No, there was some delay ❒ 1 No, it seemed to take forever

b. In general, how satisfied are you with the comfort and attractiveness of your sick call facility? *(Check one)*

❒ 1 Quite dissatisfied ❒ 2 Indifferent or mildly dissatisfied ❒ 3 Mostly satisfied ❒ 4 Very satisfied

c. Did the characteristics of the building or ship detract from the services you have received at sick call? *(Check one)*

❒ 1 Yes, very much ❒ 2 Somewhat ❒ 3 No, not much ❒ 4 No, not at all

d. How satisfied are you with the amount of help you have received at sick call? *(Check one)*

❒ 1 Quite dissatisfied ❒ 2 Indifferent or mildly dissatisfied ❒ 3 Mostly satisfied ❒ 4 Very satisfied

e. Considering your particular needs, how appropriate are the services you have received at sick call? *(Check one)*

❒ 4 Highly appropriate ❒ 3 Generally appropriate ❒ 2 Generally inappropriate ❒ 1 Highly inappropriate

f. Have the services you received at sick call helped you to deal more effectively with your problems? *(Check one)*

❒ 4 Yes, they helped a great deal ❒ 3 Yes, they helped somewhat ❒ 2 No, they really didn't help ❒ 1 No, they seemed to make things worse

g. When you talked to the doctor (or corpsman) at sick call, how closely did he or she listen to you? *(Check one)*

❒ 1 Not at all closely ❒ 2 Not too closely ❒ 3 Fairly closely ❒ 4 Very closely

h. Did you get the kind of service you wanted at sick call? *(Check one)*

❒ 1 No, definitely not ❒ 2 No, not really ❒ 3 Yes, generally ❒ 4 Yes, definitely

i. Are there other services you need but have not received at sick call? *(Check one)*

❒ 1 Yes, there definitely were ❒ 2 Yes, I think there were ❒ 3 No, I don't think there were ❒ 4 No, there definitely were not

69. —*Continued*—Please help us evaluate your health care program by answering the following questions. Please check only one box for each question.

j. How clearly did the doctor (or corpsman) at sick call understand your problem and how you felt about it? *(Check one)*

❒ 4 Very clearly ❒ 3 Clearly ❒ 2 Somewhat unclearly ❒ 1 Very unclearly

70. How competent and knowledgeable was the doctor (or Corpsman) at sick call? *(Check one)*

❒ 1 Poor abilities at best ❒ 2 Only of average ability ❒ 3 Competent and knowledgeable ❒ 4 Highly competent and knowledgeable

71. How would you rate the quality of the service you have received at sick call? *(Check one)*

❒ 4 Excellent ❒ 3 Good ❒ 2 Fair ❒ 1 Poor

72. In an overall, general sense, how satisfied are you with the service you have received at sick call? *(Check one)*

❒ 4 Very satisfied ❒ 3 Mostly satisfied ❒ 2 Indifferent or mildly dissatisfied ❒ 1 Quite dissatisfied

73. If a friend were in need of similar help, would you recommend they go to your sick call? *(Check one)*

❒ 1 No, definitely not ❒ 2 No, I don't think so ❒ 3 Yes, I think so ❒ 4 Yes, definitely

74. Have the people in your sick call generally understood the kind of help you wanted? *(Check one)*

❒ 1 No, they misunderstood almost completely ❒ 2 No, they seemed to misunderstand ❒ 3 Yes, they seemed to generally understand ❒ 4 Yes, they understood almost perfectly

75. To what extent has the Navy's health care program (at sick call) met your needs? *(Check one)*

❒ 1 Almost all of my needs have been met ❒ 2 Most of my needs have been met ❒ 3 Only a few of my needs have been met ❒ 4 None of my needs have been met

76. Have your rights as an individual been respected at sick call?
(Check one)

❒ 1 No, almost never respected
❒ 2 No, sometimes not respected
❒ 3 Yes, generally respected
❒ 4 Yes, almost always respected

77. If you were to seek help again (and had a choice), would you go back to sick call?
(Check one)

❒ 1 No, definitely not
❒ 2 No, I don't think so
❒ 3 Yes, I think so
❒ 4 Yes, definitely

78. Which of the following do you prefer to be seen by at sick call?
(Check one)

❒ 1 Female doctor
❒ 2 Male doctor
❒ 3 Female Corpsman
❒ 4 Male Corpsman
❒ 5 Other _____

WOMEN'S SECTION

HEALTH CONDITIONS (WOMEN)

79. Reproductive system health

Condition	a. Did you have this condition in the **past 90 days?** *(Check one box on each line)*			b. If yes, did you first notice the condition, or did it get worse, **since you came aboard this ship?** *(Check one box on each line if answer to the condition is "yes")*		
	No (1)	Yes (2)	Not sure (9)	First noticed (1)	Got worse (2)	Not sure (9)
a. Bleeding between periods	❒	❒	❒	❒	❒	❒
b. Cramps or pain during menstrual period requiring medication or time off work	❒	❒	❒	❒	❒	❒
c. Excessive frequency of periods (time between periods too short)	❒	❒	❒	❒	❒	❒
d. Heavy periods (excessive menstrual flow)	❒	❒	❒	❒	❒	❒
e. Period lasting longer than 1 week	❒	❒	❒	❒	❒	❒
f. Scanty menstrual flow	❒	❒	❒	❒	❒	❒
g. Abdominal pain (from known cysts)	❒	❒	❒	❒	❒	❒
h. Abdominal pain (from known endometriosis)	❒	❒	❒	❒	❒	❒
i. Abdominal pain (from other or unknown cause) *(Specify:)*	❒	❒	❒	❒	❒	❒
j. Discharge from breast	❒	❒	❒	❒	❒	❒
k. Breast lump	❒	❒	❒	❒	❒	❒
l. Other symptoms related to menstrual period *(Specify:)*	❒	❒	❒	❒	❒	❒

80. Did any of the conditions listed above (a through l) require you to:

a. Take 2 or more hours off from work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**? *(Check one box)*
1 ☐ No 2 ☐ Yes

81. During the **past 12 months** have you had regular menstrual periods? *(Check one box)*

1 ☐ No
(Please explain:_____

_____

2 ☐ Yes, about 1 per month.
3 ☐ Yes, but not 1 per month.
(Please explain:_____

_____

If you missed one or more periods during the past 12 months, please check one box below:

1 ☐ I missed my period approximately ____ ____ time(s) during the **past 12 months.**
0 ☐ I had no periods at all during the **past 12 months.**
9 ☐ I'm not sure of the number of periods I missed during the **past 12 months.**

82. During the **past 90 days** have you taken birth control pills to regulate your period? *(Check one box)*

1 ☐ No 2 ☐ Yes

83. During the **past 90 days** have you taken replacement estrogens? *(Check one box)*

1 ☐ No
2 ☐ Yes, hormone pills
3 ☐ Yes, hormone creams or other hormone preparations

84. Did you have any of these during **past 90 days**? *(Please check either "no" or "yes" for every condition listed)*

a. 1 ☐ No 2 ☐ Yes Urinary tract infection
b. 1 ☐ No 2 ☐ Yes Vaginal rash, discharge, or other vaginal disorder except yeast infection, not including sexually transmitted diseases
c. 1 ☐ No 2 ☐ Yes Yeast infection
d. 1 ☐ No 2 ☐ Yes Pelvic or lower abdominal pain
e. 1 ☐ No 2 ☐ Yes Gonorrhea
f. 1 ☐ No 2 ☐ Yes Other sexually-transmitted disease
g. 1 ☐ No 2 ☐ Yes Other genitourinary system condition
*(Please specify):*_____

85. Did any of the conditions listed above (a through g) require you to:

a. Take 2 or more hours off from work during the **past 90 days**? *(Check one box)*

1 ☐ No 2 ☐ Yes

b. Miss 1 or more days of work during the **past 90 days**? *(Check one box)*

1 ☐ No 2 ☐ Yes

86. During the past 12 months have you usually had regular menstrual periods? *(Check one box)*

1 ☐ No *(Please specify):*_____
2 ☐ Yes, about one per month
3 ☐ Yes, but not one per month

87. Has a doctor *ever* told you that you had any of the following?

(Please check one box on each line. If you check "Yes," please write your age at first diagnosis)	No (1)	Yes (2)	If yes, what was your age in years at first diagnosis
a. Abnormal Pap smear (test for cervical cancer)	☐	☐	____ ____
b. Breast lump diagnosed as benign breast cyst or fibrocystic disease *(Please specify):*	☐	☐	____ ____
c. Benign breast lump, exact diagnosis unknown	☐	☐	____ ____
d. Breast cancer	☐	☐	____ ____

PREGNANCY HISTORY

88. How many times have you been pregnant? *(Check one box)*

0 ☐ Never *(Please skip to question 92)*
1 ☐ I have been pregnant _____ _____ times.

89. Have you been pregnant during the **past 12 months**? *(Check one box)*

1 ☐ No
2 ☐ Yes

90. Are you pregnant now?
(Check one box)

1 ☐ No
2 ☐ Yes
3 ☐ Not sure

91. How many babies (live births) have you had?
(Fill in one circle)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ or more

92. What is your best estimate of the likelihood that you will become pregnant in the **next 12 months**?

*(Fill in a number between 0 and 100, with 0 representing **no chance** that the event will occur, and 100 representing that the event **definitely** will occur):*

____ ____ ____ percent

93. Please provide the following information in chronological order. For multiple outcomes, make each a separate entry (e.g., two entries for twins). Indicate only one "outcome" per pregnancy. If you are uncertain of a detail, provide your best estimate.

Pregnancy

	Outcome	What was the approximate date of this outcome?	Were you in the Navy at the time?	What was your duty station type at the time of: Conception	Outcome	Was this pregnancy planned?
a. Most recent	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
b. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
c. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
d. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No
e. Prior pregnancy	☐ 1 Live Birth ☐ 2 Stillbirth ☐ 3 Miscarriage/ spontaneous abortion ☐ 4 Ectopic pregnancy ☐ 5 Elective induced abortion	Year 19 __ __ Month __ __	☐ 1 Yes ☐ 2 No	☐ 1 Afloat ☐ 2 Aviation SQD ☐ 3 Industrial type shore ☐ 4 Other shore	☐ 1 ☐ 2 ☐ 3 ☐ 4	☐ 1 Yes ☐ 2 No Were you using birth control? ☐ 1 Yes ☐ 2 No

OB/GYN AVAILABILITY

94. During the **past 30 days** the following were readily available to me from this ship's medical department, if I needed them: *(Check one box on each line)*	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)	I did not need this item (9)
a. Birth control pills	❒	❒	❒	❒	❒	❒
b. Depo-Provera, Norplant	❒	❒	❒	❒	❒	❒
c. Condoms	❒	❒	❒	❒	❒	❒
d. Diaphragm	❒	❒	❒	❒	❒	❒
e. Pregnancy testing or test kit	❒	❒	❒	❒	❒	❒
f. Family planning information	❒	❒	❒	❒	❒	❒
g. Appropriately staffed and equipped OB/GYN medical support	❒	❒	❒	❒	❒	❒

95. Approximately how many months or days ago was your most recent: *(Fill in number of months or days for each item)*	**Number of months**	**Number of days** *(if less than 1 month)*
a. Pap smear (test for cervical cancer)?	____ ____	____ ____
d. Pelvic examination?	____ ____	____ ____
e. Breast examination by a physician or nurse	____ ____	____ ____

OB/GYN QUESTIONS FOR CURRENTLY DEPLOYED WOMEN

96. Did you request a pre-deployment appointment with a gynecologist or obstetrician from a Navy medical facility prior to this deployment?? *(For purposes of this questionnaire, deployment shall be defined as: "Ship scheduled at sea for **30 days or more**")* *(Check one box)*

1 ❒ No *(Please skip to Comments and Suggestions on the last page)*
2 ❒ Yes

95. Were you given a gynecological or obstetrical appointment? *(Check one box)*

1 ❒ No *(Please skip to Comments and Suggestions on the last page)*
2 ❒ Yes

a. Did you keep the appointment? *(Check one box)*

1 ❒ No
2 ❒ Yes

ADDITIONAL COMMENTS AND SUGGESTIONS

Additional comments you would like to add:

Suggestions for topics that should be added, changed, or deleted:

THANK YOU!

Please return to your shipboard coordinator or:

Naval Health Research Center
Code 233
P.O. Box 85122
San Diego CA 92186-5122
Telephone (619) 553-6881; DSN 553-6881

APPENDIX C.6

Anonymous Questionnaire

U.S. NAVY SHIPBOARD HEALTH SURVEY

ANONYMOUS SUPPLEMENTAL HEALTH AND BEHAVIORAL SURVEY

INFORMATION TO PARTICIPANTS

You are being asked to voluntarily complete this anonymous survey giving candid responses about behavioral issues which may affect health. Your answers are for research use only and cannot be linked to you in any way.

Privacy Act Statement

1. Authority. 5 USC 301, 10 USC 1071. OPNAV Control Symbol 6000-13C. **2. Purpose.** Medical research information will be collected to enhance basic medical knowledge or to develop tests, procedures, and equipment to improve the diagnosis, treatment, or prevention of illness, injury, or performance impairment. **3. Use.** This medical research anonymous information will be used in statistical analyses by the Departments of the Navy, Defense, and other U.S. Government agencies, provided this is compatible with the purpose for which information was collected. **4. Disclosure.** All information derived from this anonymous survey will be retained at the Naval Health Research Center, San Diego.

If you have any questions about this survey, please contact Dr. Frank C. Garland, Naval Health Research Center, San Diego CA 92186-5122/DSN: 553-6881; Commercial (619) 553-6881.

Version 0.11 20 Jun 95

DEMOGRAPHIC DATA

1. What is your gender?
(Check one box)
1 ☐ Male
2 ☐ Female

2. How old were you on your last birthday?
(Check one box)
1 ☐ 17-19 years
2 ☐ 20-24 years
3 ☐ 25-29 years
4 ☐ 30-34 years
5 ☐ 35+ years

3. Are you of Spanish/Hispanic origin or descent?
(Check one box)
1 ☐ No (not Spanish/Hispanic)
2 ☐ Yes, Mexican, Mexican-American, Chicano
3 ☐ Yes, Puerto Rican
4 ☐ Yes, Cuban
5 ☐ Yes, other Spanish/Hispanic

4. What race do you consider yourself to be?
(Check one box)
1 ☐ White
2 ☐ Black (African-American)
3 ☐ American Indian, Eskimo, or Aleut
4 ☐ Asian or Pacific Islander
9 ☐ Other race (Specify: _____)

5. How much education have you completed?
*(Check the one box that describes the highest grade or academic degree that you have **completed**.)*
1 ☐ Some high school
2 ☐ High school graduate or Graduate Equivalency Degree (GED)
3 ☐ Trade or technical school graduate
4 ☐ Some college or AA degree
5 ☐ 4-year college degree or above

6. What is your current marital status?
(Check one box)
1 ☐ Never married
2 ☐ Married
3 ☐ I am not currently married, but I live as married when I am ashore
4 ☐ Separated
5 ☐ Divorced
6 ☐ Widowed

7. How many natural children do you have? (Natural does not include adopted or step-children)
(Fill in one circle)

⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ or more

8. When you are ashore, how many of your children (natural, adopted, and step-) live with you?
(Fill in one circle)
⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ or more

9. What is your paygrade?
(Check one box)

1 ☐ E-1 to E-3
2 ☐ E-4 to E-6
3 ☐ E-7 to E-9
4 ☐ Warrant Officer
5 ☐ O-1 to O-3
6 ☐ O-4 and above

10. How many years have you served in the military?
(Check one box)
1 ☐ Less than 1
2 ☐ 1 - 2
3 ☐ 3 - 4
4 ☐ 5 - 9
5 ☐ 10 - 14
6 ☐ 15+
9 ☐ Don't know

11. If you are Navy enlisted, what is your rate (e.g., SN, FN, BT, HM, ASM)? ___ ___ ___

12. If you are Marine enlisted, what is your M.O.S. number? ____ ____ ____ ____

13. Where do you live when your ship is in your home port?
(Check one box)

1 ☐ Aboard ship
2 ☐ Navy Housing
3 ☐ BEQ/BOQ
4 ☐ Private residence
9 ☐ Other

14. If you are currently aboard ship, what is your ship's current status?
(Check one box)

1 ☐ In home port
2 ☐ At sea
3 ☐ In port other than home port
4 ☐ In shipyard
9 ☐ Other *(Please specify):*_____

15. What is today's date? Month: ____ ____ Day: ____ ____ Year: 19 9 ____
m m d d y y

16. Are you currently deployed? (Deployment is defined as an assignment where your ship has been scheduled to be at sea for **30 or more days**)
(Check one box)

1 ☐ No *(Skip to question 20)*
2 ☐ Yes

17. What date did you **begin** this deployment? Month:____ ____ Day: ____ ____ Year: 19 9 ____
m m d d y y

18. What date are you **due to return** to your home port?

Mo.:____ ____ Day: ____ ____ Year: 19 9 ____
m m d d y y
☐ Don't know

19. Is this your first deployment?
1 ☐ No *(Skip to question 20)*
2 ☐ Yes *(Skip to question 21)*

20. How many times have you deployed aboard Navy ships, **not counting present deployment?**
(Check one box)

1 ☐ 1 time
2 ☐ 2 times
3 ☐ 3 times
4 ☐ 4 times
5 ☐ 5-9 times
6 ☐ 10-19 times
7 ☐ 20 or more times
9 ☐ Don't know

21. Overall, how satisfied are you with living conditions aboard this ship?
(Check one box)

1 ☐ Very satisfied
2 ☐ Satisfied
3 ☐ Neither satisfied nor dissatisfied
4 ☐ Dissatisfied
5 ☐ Very dissatisfied

BIRTH CONTROL

22. During the past 90 days, were you trying to get pregnant (or cause a partner to become pregnant)?
(Check one box)
1 ❒ Yes
2 ❒ No
9 ❒ Don't know

23. Do you believe that you are fertile (capable of having a baby) or capable of making a partner pregnant?
(Check one box)
1 ❒ No
2 ❒ Yes
9 ❒ Don't know

24. Who do you believe is responsible for birth control?
(Check one box)
1 ❒ Me
2 ❒ Partner
3 ❒ Both of us
9 ❒ Don't know

STD PREVENTION

Note: These questions should not be construed as condoning or promoting any behavior.

25. How many partners have you had sex with during **the past 90 days**?
(Please fill in one circle on each line)

a. Female partners	⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ or more 99❒ Don't know
b. Male partners	⓪ ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ or more 99❒ Don't know

26. If you are currently deployed, did you have sex with a local resident from a port you visited?
(Check one box)

1 ❒ No
2 ❒ Yes
9 ❒ Don't know

27. During the **past 90 days,** how often did you use a condom while having sex with a person who was not your spouse or someone with whom you have a long-term (lasting at least 6 months) relationship?
(Check one box)

1 ❒ Never
2 ❒ About one-quarter of the time
3 ❒ About half of the time
4 ❒ About three-quarters of the time
5 ❒ Always
6 ❒ I did not have sex during the past 90 days
7 ❒ I did not have sex with someone who was not my spouse or long-term partner during the past 90 days

28. ***(This question is for Men only)*** During the **past 90 days,** when you had sexual intercourse, how often did you (or your partner) use any of the following types of birth control?

0 ❒ I did not have sex during **the past 90 days**
1 ❒ I have had a vasectomy (skip comments section)

(Check one box on each line)	Never (1)	Rarely (2)	Sometimes (3)	Usually (4)	Always (5)	Don't know (9)
a. No birth control method	❒	❒	❒	❒	❒	❒
b. Condom	❒	❒	❒	❒	❒	❒
c. Partner used birth control	❒	❒	❒	❒	❒	❒

MEN PLEASE STOP HERE
AND GO TO COMMENTS SECTION AT THE END.

WOMEN ONLY SECTION
BIRTH CONTROL, PREGNANCY TESTING, AND MOTIVATION

29. During the **past 90 days,** when you had sexual intercourse, how often did you (or your partner) use any of the following types of birth control?

0 ☐ I did not have sex during **the past 90 days**
1 ☐ I have had a tubal ligation (skip to question 37).

(Check one box on each line)	Never (1)	Rarely (2)	Sometimes (3)	Usually (4)	Always (5)	Don't know (9)
a. No birth control method	☐	☐	☐	☐	☐	☐
b. Birth control pills	☐	☐	☐	☐	☐	☐
c. Condom	☐	☐	☐	☐	☐	☐
d. Spermicidal foam or jelly	☐	☐	☐	☐	☐	☐
e. Depo Provera, Norplant	☐	☐	☐	☐	☐	☐
f. Interuterine device (IUD)	☐	☐	☐	☐	☐	☐
g. Diaphragm	☐	☐	☐	☐	☐	☐
h. Rhythm method	☐	☐	☐	☐	☐	☐
i. Partner had a vasectomy	☐	☐	☐	☐	☐	☐

30. Have you had a pregnancy test during **the past 90 days**?
(Check one box)

1 ☐ No *(Please skip to question 34)*
2 ☐ Yes
9 ☐ Don't know

31. What type of test was it? *(Check as many boxes as apply).*

1 ☐ Home pregnancy test (EPT, etc.)
2 ☐ Pregnancy test by this ship's medical department
3 ☐ Pregnancy test by another Navy medical facility
4 ☐ Pregnancy test by another medical facility
9 ☐ Don't know

32. What was the result of the pregnancy test?
(Check one box)

1 ☐ Negative *(Please skip to question 34)*
2 ☐ Positive
9 ☐ Don't know*(Please skip to question 34)*

33. Did you inform your Commanding Officer (or appropriate person in your chain of command) of the result of the pregnancy test?
(Check one box)

1 ☐ No
2 ☐ Yes
9 ☐ Don't know

34. Have you suspected that you may have been pregnant during **the past 90 days**?
(Check one box)

1 ☐ No
2 ☐ Yes
9 ☐ Don't know

35. Are you pregnant now?
(Check one box)

1 ☐ No *(Skip to question 37)*
2 ☐ Yes
9 ☐ Don't know *(Skip to question 37)*

36. The reason(s) I became pregnant were:
(Check one box on each line)

1☐Yes 2☐ No This pregnancy was unintentional/unplanned
1☐Yes 2☐ No I wanted a child (or another child)
1☐Yes 2☐ No I wanted a brother or sister for a child (or children) I already have
1☐Yes 2☐ No I wanted to strengthen a relationship
1☐Yes 2☐ No I wanted to get reassigned to shore
1☐Yes 2☐ No I wanted to avoid a deployment
1☐Yes 2☐ No I did not want to wait until I am too old to have children
1☐Yes 2☐ No The child's father wanted me to have this child
1☐Yes 2☐ No Other *(Specify:)*_____

ADDITIONAL COMMENTS AND SUGGESTIONS

37. What could be done during the next deployment to improve your living conditions? (Please be as detailed as possible)

38. Additional comments

THANK YOU!

Please return to your shipboard coordinator in the envelope provided or to the:
Naval Health Research Center, Code 233
P.O. Box 85122
San Diego CA 92186-5122
Telephone (619) 553-6881; DSN 553-6881

APPENDIX C.7

Supplemental Survey

U.S. Navy Shipboard Health Survey
Family Planning Supplement

FAMILY PLANNING MEN AND WOMEN

1. The statements below describe attitudes and beliefs that different people might have. Indicate how much you **AGREE** or **DISAGREE** with each of the following statements. *(Check one box on each line)*	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)
a. The whole idea of birth control is embarrassing to me.	❒	❒	❒	❒	❒
b. I think it is very important to use birth control after marriage until you have decided to start a family.	❒	❒	❒	❒	❒
c. I would not have sexual intercourse without using birth control.	❒	❒	❒	❒	❒
d. I would have sexual intercourse without birth control if my partner wanted me to.	❒	❒	❒	❒	❒
e. Sometimes when a birth control method is not available, I believe you just have to take a chance and hope for good luck to avoid causing a pregnancy.	❒	❒	❒	❒	❒
f. If I needed to go to a doctor or clinic for birth-control information, I would feel comfortable about it.	❒	❒	❒	❒	❒

Women only - Please turn and complete question 2

Serial number_____

FAMILY PLANNING WOMEN ONLY

2. (Women only) Please rate your agreement or disagreement with each of the following statements. *(Check one box on each line)*	Strongly agree (1)	Agree (2)	Neither agree nor disagree (3)	Disagree (4)	Strongly disagree (5)
a. I hope to become pregnant during the next 12 months.	❒	❒	❒	❒	❒
b. I probably will become pregnant during the next 12 months.	❒	❒	❒	❒	❒
c. My partner objects to use of birth control measures.	❒	❒	❒	❒	❒
d. Using birth control is inconvenient.	❒	❒	❒	❒	❒
e. I would not use birth- control pills because I am concerned about possible health effects.	❒	❒	❒	❒	❒
f. A sexually active woman who uses an intrauterine device (IUD) is not very likely to become pregnant.	❒	❒	❒	❒	❒
g. A sexually active woman who uses a diaphragm and contraceptive gel is not very likely to become pregnant.	❒	❒	❒	❒	❒
h. A sexually active woman whose partner always uses a condom is not very likely to become pregnant.	❒	❒	❒	❒	❒

APPENDIX C.8

Sick Call Log

Instructions for Filling Out Sick Call Log

General Instructions. Please:

- ▶ Fill out one section of this form for every person seen, both genders, including persons who are picking up prescriptions, birth control pills, etc.
- ▶ Fill in every box for every person seen. Leave no blanks.
- ▶ Print legibly. Use check marks to clearly mark only one box at a time.
- ▶ If in doubt about how to fill in an item, fill it in as completely as possible and explain the problem in the margin.

Detailed Instructions:

- ▶ Date and ship status: Print full date at top of sheet, for example ▶ 22 NOV 96. Check ▶ At sea or ▶ In port. Start new page daily or if status changes.
- ▶ Patient Information:
- ▶ Time-In: Print time patient **entered** treatment area, not time that diagnosis or treatment started, e.g., if patient arrived at 14:25 but was not seen until 15:00, print 14:25.
- ▶ Time-out: Print the time the patient left the treatment area.

1. Name: Print the patient's last name and first initial. Use all capital block letters, e.g. ▶ JONES, J.
2. SSN: Print the patient's **full** SSN using this format ▶ 123-45-6789.
4. Unit: Check the appropriate category. If none of the categories applies, check "Other" and describe, e.g.▶ ARMY.
5. Paygrade: Print paygrade, such as ▶ E - 6.
7. Rate: Use three-letter rate code when applicable, otherwise use two-letter rate code, e.g. ▶ MM (Machinist's Mate).
8. Division: Print division of ship where patient is assigned to work.
9. Complaint: Print patient's complaint, such as ▶ ACUTE ABDOMINAL PAIN, or ▶ DIARRHEA X 2 DAYS.
10. Diagnosis: This item is **very important** for accurate scientific analyses. **Provide the most specific diagnosis** possible in this facility, with sufficient detail for ICD-9 coding. This item is for the **final diagnosis on this ship.** Avoid terms such as "rule out" (R/O) unless a diagnosis cannot be made without offship tests or consultations. If there are two or more diagnoses, list the **most important diagnosis first,** followed by others in order of importance.

▶ Service/procedure: Check all services and procedures performed and prescriptions provided to the patient during this visit. Check the number of prescriptions and print the names of all drugs and supplies provided. Many procedures will not be listed. If a procedure is not listed, use the "Other" category and print the name of the procedure. Be as specific as possible. For example, print "TYPHOID IMMUNIZATION" (not "immunization").

▶ Treatment status:

1. Senior provider: Check only the most senior provider seen. For example, if the patient is seen by a hospital corpsman and by a medical officer, check ▶ M.O.
2. Visit status: If this is the patient's first visit for this diagnosis during this episode of illness or for this injury, check ▶ Initial. If this is the patient's second or later visit for this diagnosis during this episode of illness or for this injury, check ▶ Follow-up.
3. Duty status: Check the duty status assigned at the end of this visit.
4. Disposition: Check the appropriate category. If other, describe in the space provided.

▶ If you have any questions or problems with this sick call log, please contact: Dr. F. C. Garland, Head, Department of Health Sciences and Epidemiology, Naval Health Research Center, P. O. Box 85122, San Diego CA 92186-5122. Telephone: Commercial: (619) 553-6881; DSN: 553-6881; Fax: (619) 553-6891 (Vers. 1.4, 2 Nov 94)

Acceptable Abbreviations for Diagnoses

If an abbreviation not listed below is used, print out all words clearly the first time used.

ALWAYS GIVE THE MOST SPECIFIC DIAGNOSIS POSSIBLE

▶ **Acceptable abbreviations**

BCPR . .	Birth control pill refill only
CMP . . .	Chondromalacia of patella
CXP	Chest pain
DJD	Degenerative joint disease
DT	Delirium tremens
F/B.	Foreign body (specify site, e.g., eye)
Flu	Influenza
Fx	Fracture (specify site)
GC . . .	Gonorrhea
GU	Gonococcal urethritis
HCG NEG . .	Negative pregnancy test
HCG POS .	Positive pregnancy test
HNP	Herniated nucleus pulposis
HTN	Hypertension, essential
INH F/U . .	INH follow-up only
IBS	Irritable bowel syndrome
K/S	Kidney stone
LAC	Laceration
LBP	Lower back pain
Migr HA . .	Migraine headache
Mono	Mononucleosis
M/S trau .	Musculoskeletal trauma (specify site)
NGU	Non-gonococcal urethritis
NSU	Non-specific urethritis
NV	Nausea and vomiting
O/D	Overdose (specify drug)
PFB	Pseudofollicutitis barba
PID	Pelvic inflammatory disease (use only when a more specific diagnosis is not possible)
PUD	Peptic ulcer disease
SOB	Shortness of breath
ST	Sore throat, organism not cultured
STI	Soft tissue injury, not severe (specify site)
Strep	Streptococcal sore throat
TB	Tuberculosis, active (do not use for inactive TB or positive PPD)
Tens HA . .	Tension headache
TM perforation	Tympanic membrane performation
URI	Upper respiratory infection due to comon cold virus (if other type, specify)
UTI	Urinary tract infection, nonspecific, not gonococcal

▶ **Abbreviations for use when no diagnosis is made**

Admin .	Administrative visit only
N/S . .	No show
LBE . .	Left before examination
Pap . .	Pap smear only
PE . .	Physical examination only
Pelvic .	Normal pelvic exam

▶ **Acceptable qualifiers**

ETOH	Associated with alcohol
R/O .	Rule out (specify, e.g., R/O strep throat) (use only if it is not feasible to provide a final shipboard diagnosis)
S/P .	Status post (specify, e.g., S/P fx radius) (use for follow-up visits only)

▶ **Anatomic sites. Any common medical abbreviation for site is acceptable, e.g.: OD, OS, RUQ, etc.**

▶ **Unacceptable abbreviations**
▶ **Note: The following are unacceptable abbreviations in the diagnosis area.**

F/U	Follow-up (not a diagnosis).Always give the diagnosis, e.g., S/P FX RADIUS..
HCG	Do not use unless result isgiven, e.g. HCG NEG.
L/S	Limited service (not a diagnosis).
R/S	Restricted service (not a diagnosis).
RX	Prescription refill (not a diagnosis).

Acceptable Abbreviations for Services and Procedures

If an abbreviation not listed below is used, print out all words clearly the first time used.

ALWAYS BE AS SPECIFIC AS POSSIBLE

▶ **Acceptable abbreviations** for reference to tests, services, procedures, and medications only (the following are not acceptable in the diagnosis area, except as noted):

ASA	Aspirin
BCP	Birth control pills
bid	Twice a day
C & S	Culture and sensitivity
CBC	Complete blood count
CXR	Chest x-ray
FBS	Fasting blood sugar
Gtts	Drops
HCG	HCG pregnancy test(Always give result in diagnosis area)
hs	At bedtime
Hct	Hematocrit
I & D	Incise and drain
O & P	Ova and parasites
Pap	Papanicolaou smear
Pcn	Penicillin
PPD	Skin test for tuberculosis
PRN	As needed
qid	Four times a day
Sx	Symptoms
T/C	Throat culture
Tcn	Tetracycline
tid	Three times a day
Tx	Treatment
UA	Urinalysis
WNL	Within normal limits

DATE: _____ SHIP STATUS: ☐ 1 AT SEA ☐ 2 IN PORT

NHRC WILL TRANSFORM DIAGNOSIS INTO AN ICD-9 CODE
PLEASE PROVIDE SUFFICIENT, LEGIBLE INFORMATION

SICK CALL LOG

PATIENT INFORMATION	COMPLAINT & DIAGNOSIS	SERVICE / PROCEDURE	TREATMENT STATUS
TIME-IN: / TIME-OUT: 1. NAME: 2. SSN: 3. SEX ☐ 1 MALE ☐ 2 FEMALE 4. ATTACHED TO? ☐ 1 SHIP'S CREW ☐ 2 AIRWING ☐ 3 CRUDESQRU ☐ 4 OTHER: _____ 5. PAYGR. E • ___ O • ___ W • ___ 6. AGE: 7. RATE: 8. DIV.:	9. COMPLAINT 10. DIAGNOSIS (NHRC USE ONLY)	☐ 1 PHARMACY ☐ 2 X-RAY ☐ 3 LAB TEST ☐ 4 PHYSICAL EXAM ☐ 5 PREGNANCY TEST ☐ 6 PRESCRIPTIONS Number: ☐ 1 ☐ 2 ☐ 3+ Name(s): _____ ☐ 7 KOH PREP / WET MOUNT ☐ 8 GRAM STAIN / CERVICAL CULT ☐ 9 PELVIC EXAM ☐ 10 PAP TEST ☐ 11 OTHER: _____	1. SENIOR PROVIDER SEEN ☐ 1 H.M. ☐ 2 M.O. ☐ 3 PA / NP ☐ 4 OTHER: _____ 2. VISIT STATUS ☐ 1 INITIAL ☐ 2 FOLLOWUP 3. DUTY STATUS ☐ 1 FULL DUTY ☐ 2 LIGHT DUTY ☐ 3 NO DUTY / SIQ 4. DISPOSITION ☐ 1 RESOLVED ☐ 2 RETURN PRN ☐ 3 RETURN VISIT ☐ 4 REFERRED ☐ 5 HOSPITALIZED ☐ 6 MEDEVAC

PATIENT INFORMATION	COMPLAINT & DIAGNOSIS	SERVICE / PROCEDURE	TREATMENT STATUS
TIME-IN: / TIME-OUT: 1. NAME: 2. SSN: 3. SEX ☐ 1 MALE ☐ 2 FEMALE 4. ATTACHED TO? ☐ 1 SHIP'S CREW ☐ 2 AIRWING ☐ 3 CRUDESQRU ☐ 4 OTHER: _____ 5. PAYGR. E • ___ O • ___ W • ___ 6. AGE: 7. RATE: 8. DIV.:	9. COMPLAINT 10. DIAGNOSIS (NHRC USE ONLY)	☐ 1 PHARMACY ☐ 2 X-RAY ☐ 3 LAB TEST ☐ 4 PHYSICAL EXAM ☐ 5 PREGNANCY TEST ☐ 6 PRESCRIPTIONS Number: ☐ 1 ☐ 2 ☐ 3+ Name(s): _____ ☐ 7 KOH PREP / WET MOUNT ☐ 8 GRAM STAIN / CERVICAL CULT ☐ 9 PELVIC EXAM ☐ 10 PAP TEST ☐ 11 OTHER: _____	1. SENIOR PROVIDER SEEN ☐ 1 H.M. ☐ 2 M.O. ☐ 3 PA / NP ☐ 4 OTHER: _____ 2. VISIT STATUS ☐ 1 INITIAL ☐ 2 FOLLOWUP 3. DUTY STATUS ☐ 1 FULL DUTY ☐ 2 LIGHT DUTY ☐ 3 NO DUTY / SIQ 4. DISPOSITION ☐ 1 RESOLVED ☐ 2 RETURN PRN ☐ 3 RETURN VISIT ☐ 4 REFERRED ☐ 5 HOSPITALIZED ☐ 6 MEDEVAC

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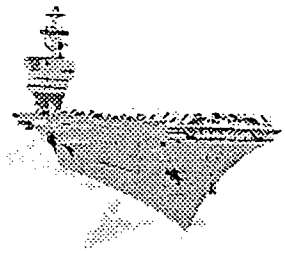
APPENDIX D

Medical Department Structured Discussions

NAVAL HEALTH SHIPBOARD RESEARCH
DEPARTMENT OF HEALTH SCIENCES AND EPIDEMIOLOGY
NAVAL HEALTH RESEARCH CENTER, CODE 233
PO BOX 85122
SAN DIEGO, CA 92186-5122
PHONE (619) 553-6896/1224 (DSN 553)
FAX (619) 553-6891



SHIPBOARD HEALTH CARE DISCUSSION GUIDELINES

NAME OF SHIP

LOCATION OF SHIP

NHRC PROJECT COORDINATOR DATE

NOTES

SECTION ONE SHOULD BE DISCUSSED WITH SENIOR MEDICAL DEPT REPRESENTATIVE (SMDR)

SECTION TWO SHOULD BE DISCUSSED WITH THE SENIOR MEDICAL OFFICER (SMO)MO OR DESIGNATED HEALTH CARE PROVIDER

KR/RS
4/95

REVISION 1

SHIPBOARD HEALTH CARE
DISCUSSION GUIDELINES

SECTION ONE

PART A: HUMAN RESOURCES
PART B: FISCAL AND EQUIPMENT RESOURCES
PART C: AUTOMATED DATA PROCESSING (ADP) RESOURCES
PART D: LOGS AND RECORDS
PART E: MORBIDITY AND INCIDENCE DATA

NAME	RANK/RATE	TITLE

PERSONNEL IN ATTENDANCE DURING DISCUSSION

_____

_____

_____

_____

_____

Discussion started: _____
(TIME AND DATE)

Discussion ended: _____
(TIME AND DATE)

NOTE
1. SECTION ONE SHOULD BE DISCUSSED WITH SMDR OR DESIGNATED REPRESENTATIVE

NAVAL HEALTH SHIPBOARD RESEARCH
SHIPBOARD HEALTH CARE

SECTION ONE, PART A: HUMAN RESOURCES

MEDICAL DEPARTMENT BILLET PROFILE

	MC	MSC	PA	IDC	NC	HM
AUTHORIZED BILLETS:						
FILLED BILLETS:						

1. If there are medical officer's assigned, what NOBC's are represented? _____

_____

2. Within the Hospital Corps community, how many assigned are:

_____ (Male) _____ (Female)

A: What NEC's are represented?

_____ _____ _____ _____ _____ _____ _____ _____

3. Do you feel your human resources are adequate to meet mission requirements? **YES** **NO**

4. Additional comments and concerns regarding human resources:

_____

_____

_____

_____

SECTION ONE, PART B: FISCAL AND EQUIPMENT RESOURCES

1. Do you feel your budget is adequate to support mission requirements? **YES** **NO**

2. Is your AMAL adequate to support women's health care needs? **YES** **NO**

3. Do you have an AMAL designed specifically for Women at Sea? **YES** **NO**

4. Do you have adequate supplies for pregnancy testing? **YES** **NO**
(IF NO, IDENTIFY YOUR NEEDS.)_____

_____

5. What, if any, recommendations have you made for AMAL changes to enhance your ability to diagnosis and treat women more effectively?

_____

_____

_____

_____

SECTION ONE, PART C: AUTOMATED DATA PROCESSING (ADP) RESOURCES

1. What type of ADP equipment is being used by medical?

_____

_____

2. Is SAMS (Shipboard Non-Tactical ADP Program (SNAPS) Automated Medical System) being used by medical.

YES **NO**

3. What version of SAMS is being used? _____

SECTION ONE, PART C: ADP RESOURCES (CONTINUED)

4. Which of the following modules of SAMS are being used:

MODULE

___Master Tickler	___Medical Encounters
___Radiation Health	___Occ\Env Health
___Supply Management	___Training Management
___Schedule Management	___System Management

(X = BEING USED)

4A. Do you use the following sub-modules of SAMS?

___Pharmacy (Supply Management) ___Lab (Medical Encounters)

---

5. What is your primary use of SAMS?

_____

6. If you are not using the Medical Encounter module of SAMS, are you capturing medical encounter information on any type of ADP? **YES NO (IF YES, EXPLAIN)**

_____

_____

_____

SECTION ONE, PART D: LOGS AND RECORDS

1. What type of information is being recorded in your sick call log?

_____

_____

2. Is a separate log maintained for:

___Pharmacy	___Lab
___X-Ray	___Physical Exams
___STD	___Pregnancy Testing

(X=LOG IS MAINTAINED)

3. What type of information is recorded in these logs?

_____

SECTION ONE, PART E: MORBIDITY AND INCIDENCE DATA

1. How many women have been transferred, since 01 January, 1995, due to pregnancy?_____

2. Can you provide incidence data on the STD's listed below?

__/__	__/__	__/__	__/__	__/__
HIV	Herpes	Chlamydia	Gonorrhea	V-Warts

(USE JAN 01 1995 AS REFERENCE DATE) __male/female__

3. Approximately, how many patients are seen by medical on a daily basis?_____

4. Approximately, how many female patients are seen by medical on a daily basis?_____

5. How many Medical Evacuations have been conducted since 01 January, 1995._____

SECTION ONE, PART E: MORBIDITY AND INCIDENCE DATA (continued)

6. Were any of these Medical Evacuations due to pregnancy?

   YES NO (HOW MANY)_____

7. What was the total number of pregnancy tests conducted aboard this ship beginning 01 January, 1995? _____(TESTS)

8. How many women took **more than one** pregnancy test aboard this ship during the period beginning 01 January, 1995?_____ (WOMEN)

9. How many women were confirmed pregnant by a pregnancy test aboard this ship beginning 01 January, 1995?_____(WOMEN)

10. Has there been a increase in the number of women requesting pregnancy testing prior to deployment? YES NO

11. Since 01 January, 1995, how many days has this ship been:

    _____(AT SEA) _____(IN PORT)

SENIOR MEDICAL DEPARTMENT REPRESENTATIVE (SMDR) COMMENTS, CONCERNS AND OR RECOMMENDATIONS:

SENIOR MEDICAL DEPARTMENT REPRESENTATIVE (SMDR) COMMENTS, CONCERNS AND OR RECOMMENDATIONS: (continued)

OBSERVATIONS BY PROJECT COORDINATOR:

SHIPBOARD HEALTH CARE
DISCUSSION GUIDELINES

SECTION TWO

PART A: HEALTH CARE PROVIDER ISSUES
PART B: TRAINING AND EDUCATION / HEALTH AWARENESS

NAME	RANK/RATE	TITLE

PERSONNEL IN ATTENDANCE DURING DISCUSSION

_____

_____

_____

_____

_____

Discussion started: _____
(TIME AND DATE)

Discussion ended: _____
(TIME AND DATE)

NOTE
1. SECTION TWO SHOULD BE DISCUSSED WITH SENIOR MEDICAL OFFICER (SMO) OR DESIGNATED HEALTH CARE PROVIDER

SECTION TWO, PART A: HEALTH CARE PROVIDER ISSUES

1. When examining female patients, does the layout of your facility allow for adequate privacy? **YES** **NO**

2. Is your staff able to provide female stand-by's for female patients? **YES** **NO**

3. Are non-medical females routinely used as stand-by's? **YES** **NO**

4. As a provider, do you feel you have been adequately trained to perform GYN exams and treat common female specific problems? **YES** **NO**

_____

_____

5. As a provider, do you have the diagnostic equipment that you need to diagnosis illnesses in women? **YES** **NO**
(IF NO, WHAT ARE YOUR SHORTFALLS?)_____

_____

6. Do you have adequate supplies to conduct PAP Smears? **YES** **NO**
(IF NO, WHAT ARE YOUR SHORTFALLS?)_____

_____

7. Have there been occasions, while deployed, that you have had to medically transfer female patients to an increased echelon of care? **YES** **NO**

8. In these cases of medical transfers, were there any female patients transferred because of inadequate supplies, equipment or medical expertise? **YES** **NO**

_____

_____

SECTION TWO, PART A: HEALTH CARE PROVIDER ISSUES (CONTINUED)

9. With reference to the number of confirmed pregnancies, are you aware of how many were unplanned? **YES** **NO**

_____

10. With reference to any unplanned pregnancies, do you know if contraceptives were being used? **YES** **NO**

11. Which of the following contraceptives are available to your crew?

____Condoms ____BCP's ____Diaphragms

____Depo Provera ____Foam ____IUD

____Norplant ____Surgical Intervention

(X=AVAILABLE)

12. Is your supply of these contraceptives adequate? **YES** **NO**
(IF NO, WHAT ARE YOUR SHORTFALLS?)_____

_____

13. Of the available contraceptives, rank the top three by demand.

____Condoms ____BCP's ____Diaphragms

____Depo Provera ____Foam ____IUD

____Surgical Intervention

(NUMBER 1 = MOST DEMANDED)

14. Once a pregnancy has been confirmed, is the confirmation verified by a shore facility? **YES** **NO**

15. When women report aboard, on PCS, is pregnancy testing a routine part of the check-in procedure. **YES** **NO**

SECTION TWO, PART A: HEALTH CARE PROVIDER ISSUES (CONTINUED)

16. Are women tested for pregnancy, prior to an extended deployment, as routine protocol? **YES** **NO**

SECTION TWO, PART B: TRAINING AND EDUCATION / HEALTH AWARENESS

1. Aboard this ship, which of the following in-services are conducted on routine basis: **(X=BEING CONDUCTED)**

____Birth control methods _____Health promotion

____STD _____Navy pregnancy policy ____Other

_____

_____

2. Aboard this ship, which of the following handouts / pamphlets are readily available?

____Birth control methods _____Health promotions

____STD _____Navy pregnancy policy

____Other **(X=READILY AVAILABLE)**

3. Concerning the Navy's policy on pregnancy, how is the policy explained to your personnel?

_____

_____

_____

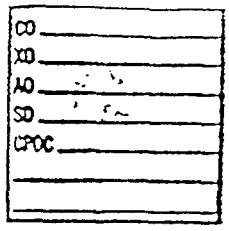
4. What do you feel are the major issues are facing women aboard this ship?

SENIOR MEDICAL OFFICER (SMO) OR HEALTH CARE PROVIDER COMMENTS, CONCERNS AND OR RECOMMENDATIONS:

OBSERVATIONS BY PROJECT COORDINATOR:

APPENDIX E

Department of the Navy (DoN) Pregnancy Policy



DEPARTMENT Of THE NAVY
Office of the Secretary
1000 Navy Pentagon
Washington DC 20350-1000

SECNAVINST 1000.10
ASN(M&RA)
6 February 1995

SECNAV INSTRUCTION 1000.10

From: Secretary of the Navy
To: All Ships and Stations

Subj: DEPARTMENT OF THE NAVY (DON) POLICY ON PREGNANCY

Ref: (a) DOD 4165.63-M of SEP 93 (DOD HOUSING MANAGEMENT MANUAL) (NOTAL)
(b) U.S. Code, Title 10

1. Purpose

a. To provide a DON policy for all military personnel on pregnancy and issues related to pregnant servicewomen that will build positively on existing programs in the Navy and Marine Corps to ensure equality of opportunity while maintaining operational readiness;

b. To expand the requirements for education and training;

c. To establish a requirement for the collection of objective data, and analysis of information for use in evaluation of DON pregnancy policies;

d. To help guide the department's future efforts in this area.

2. Applicability. This instruction applies to all DON military personnel, both Regular and Reserve, except midshipmen.

3. Background

a. The mission of the DON requires the highest level of operational readiness to meet the nation's strategic goals. A full complement of highly trained personnel is essential to maintaining operational readiness in deployable units.

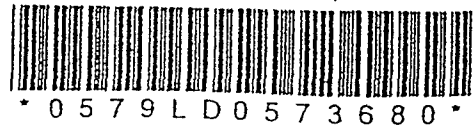
b. Women are full participating members of the Navy-Marine Corps Team. DON leadership recognizes that pregnancy is a natural event that can occur in the lives of Navy and Marine Corps servicewomen, and is not a presumption of medical incapability. Pregnancy could affect a command's operational readiness by temporarily limiting a servicewoman's ability and availability to perform all assigned tasks. Consideration of this reality requires establishment of policies and procedures which accord due regard to the demands of parenting in the Service and address career and health issues.

4. Policy. It is DON policy that:

a. Pregnancy and parenthood are compatible with a naval career. The DON will ensure the health care needs of pregnant servicewomen are met and will accommodate the career and welfare needs of pregnant servicewomen to the greatest extent possible, consistent with the needs of the naval service.

b. Military responsibilities, including the expeditionary nature of our Navy and Marine Corps, often add factors for serious consideration for our servicemen and servicewomen. Appropriate and thorough family planning information will be made available to our servicemen and servicewomen throughout our training establishment and at the unit level. Our goal is to ensure all personnel are aware of the broad range of medical, legal, financial, chaplain and other services available to assist and encourage our men and women in making family planning decisions that are supportive of both their naval service and their parental responsibilities.

c. Advice concerning personal decisions, including issues of faith, character, parental responsibilities, individual core values and medical concerns, will be readily available to those who seek it.



d. Services will provide detailed guidance for the assignment and management of pregnant servicewomen.

e. A servicewoman who is transferred from her unit because of pregnancy will be returned to the same billet, or an equivalent billet in a command of the same type duty, whenever possible to the same command, following her pregnancy and any related convalescent leave and period of deferment.

f. A servicewoman who suspects she is pregnant is responsible for promptly confirming her pregnancy through testing by an appropriate medical provider and informing her commanding officer of confirmation.

g. Regarding the requirement for appropriate housing for pregnant servicewomen, a pregnant active duty servicewoman with no family members may reside in Bachelor Quarters for her full term. If the servicewoman requests, the host commander may authorize a pregnant servicewoman to occupy off-base housing and be paid a basic allowance for quarters (BAQ) up to her twentieth week of pregnancy. From the twentieth week forward, the host commander must aprove such a request. Reference (a) outlines the policy for application to government family housing. Payment of BAQ will be in accordance with applicable pay and entitlement regulations.

h. Active duty servicewomen will be given priority in receiving routine obstetric/gynecologic (OB/GYN) care in all DON medical facilities. Further, it is DON policy that active duty servicewomen assigned to imminently deploying units or positions (within 3 months) will be given priority over other active duty servicewomen receiving routine OB/GYN care in all DON medical facilities. Under Chapter 55 of reference (b), active duty servicemembers have a statutory entitlement to care in medical facilities of the uniformed services. Such care is authorized for other categories of beneficiaries on a space available basis.

i. Medical limitations and/or assignment restrictions, or periods of absence because of pregnancy or associated medical care shall not be the basis for downgrading marks or adverse comments. As always, evaluations and fitness reports shall be based on demonstrated performance.

j. A pregnant servicewoman may request separation from active duty. Requests for separation will not normally be approved unless there are extenuating circumstances or the request otherwise complies with criteria for separation promulgated by the Services.

k. The chain of command shall ensure that servicemembers will be afforded the opportunity to take advantage of available legal assistance for advice regarding their options in establishing paternity.

5. Action. The Chief of Naval Operations (CNO) and Commandant of the Marine Corps (CMC) shall:

a. Implement policies of this instruction no later than 60 days from date of signature.

b. Notify the Assistant Secretary of the Navy (Manpower and Reserve Affairs) of substantive changes to Service policies not less than 30 days prior to implementation of those changes.

c. Provide appropriate training as necessary to ensure consistency with the goals of paragraph 4b.

d. Ensure command support for all servicewomen to obtain OB/GYN care while on active duty. Reinforce current policy to ensure active duty servicewomen are afforded priority for routine OB/GYN care consistent with paragraph 4h.

e. Within 1 year of the issuance of this instruction and biennially thereafter, provide a report to ASN(M&RA) on the following:

(1) Service analyses concerning the effect of pregnancy and other medical, administrative, and disciplinary factors on deployability of servicewomen and servicemen.

(2) Assessment of health care risks associated with pregnancy and other types of medical conditions that may exist for servicewomen and servicemen assigned to operational/deployable commands and support commands with significant occupational health considerations (e.g., ship and airplane construction/repair facilities, etc).

(3) Assessment of the training provided to officers and enlisted personnel to achieve the goals of paragraph 4b.

(4) Assessment of the impact of the policy and actions ensuring priority for routine OB/GYN care for active duty servicewomen and, within that category, first priority for servicewomen assigned to imminently deploying units or positions.

(5) Assessment of the worldwide availability of and access to appropriately staffed and equipped military OB/GYN medical support. This assessment should include the possible impact of mobilization and assignment of pregnant reserve servicemembers to stations within the continental U.S.

6. Report. The reporting requirement contained in this instruction is assigned Report Control Symbol SECNAV 1000-1 and is approved for 3 years from the date of this instruction.

JOHN H. DALTON
Secretary of the Navy

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APPENDIX F

Congressional Recommendations

CONGRESSIONAL ACTIONS ON FY 1994 BUDGET
TABLE 1

PRESIDENT'S BUDGET	HASC Report 103-200, 7/30/93	SASC	HAC Report 103-254. 9/22/93	SAC Report 103-153, 10/04/93	JOINT AUTHORIZATION Report 103-357, 11/10/93	JOINT APPROPRIATION
No request	+20M	None	+$40M	None	+20M	+$40M - special interest
	Page 181 - Committee is concerned with the dearth of medical research and study of the unique medical problems related to female members of the armed forces as well as other women eligible for medical services from the department. ...recognizes that women in the military continue to face a host of health issues, related to combat and other in-line-of-duty situations, including stress, exposure to toxins, reproductive health, menopause, mental health and sexual violence. Many issues are of unique concern to women in the military, but have been overlooked by the military medical research and service provider community. The expanding population of women in the military offers a distinctive and reliable number of potential subjects for long-term, gender-specific research studies. Studying this cohort and monitoring the military medical care system for gender-specific issues will provide the military with valuable clinical data for both military and civilian women. To address this problem...recommends the establishment of a Defense Women's Health Research Center. These provisions would further require that clinical medical research conducted or supported by the department shall include women and members of minority groups, and that data collected by such research be coded to allow for analysis of gender or racial differences among subjects.	None	Page 192 - The Committee has recommended $40,000,000 only to be used for research on women's health issues related to service in the armed forces.	Page 375 - The Committee directs the Department to provide a report evaluating the provision of preventive and primary health care services through military medical treatment facilities and the Civilian Health and Medical Program of the uniformed services to female members of the uniformed services and female covered beneficiaries eligible for health care under chapter 55 of title 10, United States Code. This report shall include a description of the demographics of the population, the leading categories of morbidity and mortality, a description of the numbers and types of health care providers employed in providing health care, and descriptions of programs the Department has in place or plans to implement to assess the health needs of women.	Page 612 - The conferees agree that the Secretary of Defense may establish a women's health research center at an existing DoD medical center .... The conference agreement would authorize an additional $20.0 million of fiscal year 1994 defense research funds in PE 63002A for establishment of the center or for medical research relating to women's service in the military at existing DoD medical centers, should the Secretary choose not to establish the center. The conferees agree that the purpose of this funding is to provide a coordinated effort for medical research within DoD on women's health issues in relation to women's service in the military. The Department of Defense must spend this funding for that purpose under a single coordinating agent within DoD. Statutory Requirements are on Page 63.	Page 110 - DD Form 1414 for fiscal year 1994 shall show the items marked with an asterisk ("*") as Congressional interest items, a change to which requires prior approval.

Table 1

CONGRESSIONAL ACTIONS ON FY 1995 BUDGET
TABLE 2

PRESIDENT'S BUDGET	HASC Report 103-449, 5/10/94	SASC Report 103-282, 6/14/94	HAC Report 103-562, 6/27/94	SAC Report 103-321, 7/29/94	JOINT AUTHORIZATION Report 103-701, 8/12/94	JOINT APPROPRIATION Report 103-747, 9/26/94
No Request	+$40M	+$40M to PE 63002D	+40.0M	+40M	+40M	+40M
	Page 145 - At a time of women's growing presence and new role in the military, the committee is concerned with the dearth of medical research and study of the unique medical problems relating to female members of the armed forces and other women eligible for medical services from the Department. . . . The Department of Defense has established a tri-service research program with the Army acting as the executive agency for implementation of this research. The committee commends the Department and the ... (USAMRDALC) for its development of a strong program that focuses on: epidemiological research and data base development; policies and standards issues; and solutions-oriented research. The committee applauds the Department and the Army for its rapid development of a program that minimizes overhead costs and will, if sustained, add significantly to the quality of life of women service members, add to the readiness of the forces, and add to women's medical care. This section would authorize $40.0 million in PE 603002A to continue this program.	Page 104 - The committee supports the decision ...to carry out medical research relating to the service of women in the military in a decentralized fashion rather than through... a center....supports the proposed tri-Service research program on women's health with the Army ...as the executive agency. ... recommends a provision that would provide a statutory charter for the program...adds $40.0 million to PE 63002D to continue the program...clear to the committee that the increasing participation of women in the military...created new requirements for medical research. These requirements span the military services and are insufficiently addressed by the much larger medical research programs of the Department of Health and Human Services (HHS), which focus on the general health care needs of the American population. Requirements include research on combat stress and trauma, on exposure to toxins and environmental and occupational hazards associated with military service, and on patterns of illness in military servicewomen. CONTINUED	Page 273 - The Committee has included $40,000,000 for the Defense Women's Health Program. The Committee notes that Magee-Women's Hospital in Pittsburgh is a national leader in addressing women's health problems and encourages the Department of the Army to work with the hospital as it develops and implements this program.	Page 238 - ...the Committee approves $40,000,000 to continue the Defense Women's Health Program. Page 355 - The Committee directs that a portion of the funding for the Defense Women's Health Program be used for a comprehensive preventive research program on Paget's disease, osteoporosis, osteogenesis imperfecta, and related bone diseases. CONTINUED	Page 41 - (Note: Statutory basis for program continuation) Sec. 241. Defense Women's Health Research Program. (a) ...The program shall continue to serve as the coordinating agent for multi-disciplinary and multi-institutional research within the Department of Defense on women's health issues related to service in the Armed Forces. The program shall continue to coordinate with research supported by other Federal agencies that is aimed at improving the health of women. (b)... The Departments of the Army, Navy and Air Force shall each participate in the activities under the program. (c)...The Secretary of Defense shall designate the Secretary of the Army to be the executive agent for administering the program. CONTINUED	No language

TABLE 2 CONTINUED

PRESIDENT'S BUDGET	HASC Report 103-449, 5/10/94	SASC Report 103-282, 6/14/94	HAC Report 103-562, 6/27/94	SAC Report 103-321, 7/29/94	JOINT AUTHORIZATION Report 103-701, 8/12/94	JOINT APPROPRIATION
		The key to the defense women's health program, as it is for the rest of the DoD medical research program, is to focus limited DoD resources on the specialized needs of service members related to their military service and to leverage, not duplicate, the $11.5 billion annual research program of the National Institutes of Health and the $2.0 billion annual investment of the Centers for Disease Control and Prevention. The Committee is especially concerned, for example, that DOD conduct adequate research into the possible mental and physical threats that women may face if they become prisoners of war.		Page 355 - The Committee urges the Defense Women's Health Program to work closely with the National Institute of Arthritis, the lead Institute on bone diseases. Page 356 - The Committee instructs the Department of Defense to ensure that the Women's Health Research Program support at least two research centers within schools of social work in communities with large concentrations of military families (including the University of Hawaii). The centers would conduct research on the impact on the health functioning of women in the military of psychosocial factors resulting from family violence, military deployment, and downsizing, with special attention to research on intervention strategies undertaken by social workers as primary providers of health care to military families.	Sec 241 (continued) (d) ... If the Secretary of Defense intends to change the plan for the implementation of the program previously submitted to the Committees on Armed Services of the Senate and House of Representatives, the amended plan shall be submitted to such committees before implementation. (e) ... The program shall include the following activities regarding health risks and health care for women in the Armed Forces: (1) The coordination and support activities described in section 251 of Public Law 103-160. (2) Epidemiologic research regarding women deployed for military operations, including research on patterns of illness and injury, environmental and occupational hazards (including exposure to toxins), side-effects of pharmaceuticals used by women so deployed, psychological stress associated with military training, deployment, combat and other traumatic incidents, and other conditions of life, and human factor research regarding women so deployed. (3) Development of a data base to facilitate long-term research studies on issues related to the health of women in military service, and continued development and support of a woman's health information clearinghouse to serve as an information resource for clinical, research, and policy issues affecting women in the Armed Forces. (4) Research on policies and standards issues, including research supporting the development of military standards relating to training, operations, deployment, and retention and the relationship between such activities and factors affecting women's health. (5) Research on interventions having a potential for addressing conditions of military service that adversely affect the health of women in the Armed Forces. (f) ... Of the amount authorized to be appropriated pursuant to section 201, $40,000,000 shall be available for the Defense Women's Health Research Program referred to in subsection (a).	

APPENDIX G

Results

APPENDIX G.1

Descriptive Tables of Demographic Characteristics, Family Structure, and Women's Health-Related Issues, and Occupational Exposures of Personnel Participating in the U.S. Navy Women Aboard Ship Study

Frank C. Garland, Ph.D. and David S. Timberlake, M.P.H.

REPORT TOPIC AREA: DESCRIPTIVE TABLES OF DEMOGRAPHIC CHARACTERISTICS, FAMILY STRUCTURE, AND WOMEN'S HEALTH-RELATED ISSUES, AND OCCUPATIONAL EXPOSURES OF PERSONNEL PARTICIPATING IN THE U.S. NAVY WOMEN ABOARD SHIP STUDY

LEAD AUTHORS: Frank C. Garland, Ph. D., and David Timberlake, M.P.H.

ABSTRACT

This report presents demographic and other characteristics of the population participating in the U.S. Navy Women Aboard Ship Study, a project conducted as part of the Defense Women's Health Research Program. This tabular presentation focuses on 4 topic areas: (1) demographic characteristics, (2) family structure, (3) women's health-related issues, and (4) occupational exposures. The population (n = 4,337) was predominately young (age < 30 years); approximately 50% were white and 30% were black. The population consisted of 93% enlisted personnel, 4.3% warrant officers, and 2.7% officers. The majority of the population, 54.5%, had served 3 years or less aboard ship. The number of years served aboard ship varied by gender, as indicated by 62.6% of women and 46.9% of men having served 3 years or less. Marital status varied by gender; 40.1% of men reported not being currently married compared to 48.8% of women reporting not currently being married. Nearly two-third (65%) of married personnel reported having one or more children in their household. For all personnel, 16% of women and 8% of men reported being single parents. Women's health issues addressed in this report covered self-reported medical conditions and availability of Ob/Gyn supplies. The majority of women, 84% reported not having been medically screened prior to deployment. The majority of women agreed that counseling for a range of medically-related issues was available. Availability of protective gear (i.e., gloves, respirators, ear plugs) for use in current job, proper fit of protective gear, use of protective gear when needed, and interference from the gear with ability to perform work are reported.

INTRODUCTION

This study is part of the Women Aboard Navy Ships Comprehensive Health and Readiness Research Project conducted at the Naval Health Research Center in San Diego, California as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. This epidemiologic research project utilizes several data collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important characteristics. The study has a longitudinal design with women and men enrolled in Year 1 of the study being contacted again and re-surveyed on a 12-month cycle in Year 2. All women reporting aboard

ship (and matched men) in Year 2 also will be enrolled. This is a report of Year 1 survey results, based on 9 months of data collection.

METHODS

Population

All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1. An equal number of men serving aboard ship matched on relevant characteristics were also eligible. The Navy Bureau of Personnel (PERS-OOW) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were determined to be eligible for inclusion in the study.

This report is based on the first 22 ships surveyed. These ships were surveyed based on availability as determined by the Commanding Officer and Medical Department of each ship. The ships surveyed included the USS BARRY, CAMDEN, CAPE COD, COMSTOCK, CORONADO, CURTIS WILBUR, DIXON, EMORY S. LAND, GRAPPLE, GRASP, HOLLAND, KISKA, L.Y. SPEAR, MONONGAHELA, MOUNT BAKER, MOUNT HOOD, PLATTE, RAINIER, SANTA BARBARA, SHENANDOAH, SUPPLY, and YELLOWSTONE. These 22 ships had 3,813 women and 12,176 men assigned aboard.

Matching

The men aboard ship included in this study were matched to women on the following characteristics: ship, work division, department, ethnicity (white, black, Hispanic, and other), pay grade (E1-E3, E4-E6, E7-E9, O1-O3, O4-O6), rating (if no individual was available in the same rating, an individual with a closely related rating was selected), and date of birth (nearest date of birth, not to exceed plus or minus two years). In the infrequent instances where these criteria could not be met, men that matched as closely as possible to women were selected.

The procedure for selection of the matched men in the study was accomplished as follows: (1) the eligible population was determined using NHRC files, and an electronic roster was developed which included all data elements needed for matching; (2) the personnel department of each ship provided an electronic roster with limited information which was compared to the NHRC roster, and a final roster was determined; (3) a matching program was run to select the men to be included in the survey; and (4) individual identification labels were created and affixed to survey packets.

Survey Development

Several methods were used for the development of the U.S. Navy Shipboard Health Survey used in this study, including the following: (1) review of extant questionnaires, literature, and standard scales, (2) convening of a panel of subject matter experts, (3) elicitation of major issues from knowledgeable sources, and (4) review of Navy requirements concerning the reporting of women's health and access to health care.

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities [1-2] were reviewed and adopted for use in this study. The questionnaires developed by the CDC included the National Health Interview Survey [3], the Health Interview Survey Form HIS-1(1992) and HIS-2(1992) [4-5], the National Ambulatory Health Care Survey for 1994, 1995, and 1996 [6], and the Youth Behavior Survey [7]. Previous questionnaires developed by the Naval Health Research Center also were reviewed, and ranged from nutrition surveys to patient care surveys. In addition, a series of scales and inventories were reviewed and selected for use. These standard scales included but were not limited to: Center for Epidemiological Studies Depression Scale (CES-D) [8], a scale which measures the current frequency of depressive symptoms, and the Quality of Life Scale [9], a four-item scale previously used in research on Navy populations. [Individual investigators should add relevant methods as needed, i.e., information on items used and statistical procedures employed]

Survey Administration

The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign informed consent and to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all study subjects to remain in one area, surveys were distributed, and the participants were allowed to fill them out in work spaces. The completed surveys were collected by study staff in sealed envelopes in all cases.

Response Rates

The overall median ship response rate for the 22 ships was 65.1%, and the overall mean response rate was 56.5%. The overall median response rate for women was 67.4%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had an overall median response rate of 74.7% compared to ships with more than 100 women assigned, which had an overall median response rate of 49.6%.

Results

1. Demographics

Table 1.Survey respondents by age and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 2. Survey respondents by race and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 3. Survey respondents by pay grade and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 4. Survey respondents by number of years served aboard ship and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 5. Survey respondents by number of previous deployments (30 days or more) and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

2. Family Structure

Table 6. Survey respondents by marital status and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 7. Number of children (natural, adopted, or stepchildren) under the age of 21 living in a household of a survey respondent, by age group of child and respondent gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 8. Number of children (actual, adopted, or step children) under the age of 21 years living in households of naval personnel, by marital status, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

3. Women's Health Issues

Table 9. Personnel reporting being medically screened prior to deployment, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 10. Self-Reported medical conditions during the past 30 days whether or not they resulted in a sick call visit, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 11. Availability of counseling during the past 30 days according to respondent, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 12. Availability of Ob/Gyn supplies, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

4. Occupational Exposures

Table 13. Self-Reported occupational exposures, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Table 14. Availability of protective gear for use in current job, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

5. Additional Women's Health Issues

Table 15. Number and percent of women who reported requesting a gynecological appointment prior to deployment

Table 16. Number and percent of women requesting a gynecological appointment prior to deployment who reported receiving one

Notes:

This work was supported by Department of Defense Funds with the U.S. Army as the Executive Agent. Opinions, interpretations, conclusions and recommendations are those of the author and are not necessarily endorsed by the U.S. Navy, the U.S. Army, or the Department of Defense.

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9. Naval Health Research Center. NHRC Technical Report 88-43, reporting on Andrews-Withey 1976 Quality of Life Scale, 1988.

Table 1. Survey respondents by age and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Age group (years)	Women		Men		Total *	
	Number	Percent	Number	Percent	Number	Percent
17 to 19	199	9.2	142	6.6	341	7.9
20 to 24	897	41.4	916	42.8	1,813	41.8
25 to 29	462	21.3	417	19.5	879	20.3
30 to 34	342	15.8	351	16.4	693	16.0
35 to 39	179	8.3	198	9.2	377	8.7
40 to 44	57	2.6	72	3.4	129	3.0
45 to 49	9	0.4	10	0.5	19	0.4
Not reported	24	1.1	35	1.6	86	2.0
Total	2,169	100.0	2,141	100.0	4,337	100.0

* Includes respondents not reporting gender.

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Table 2. Survey respondents by race and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

	Women		Men		Total *	
Race	Number	Percent	Number	Percent	Number	Percent
White, non-Hispanic	1,082	49.9	1,146	53.5	2,228	51.4
White, Hispanic	128	5.9	113	5.3	241	5.6
Black, non-Hispanic	660	30.4	600	28.0	1,260	29.1
Black, Hispanic	52	2.4	33	1.5	85	2.0
Asian/Pacific Islander	83	3.8	94	4.4	177	4.1
Native American	32	1.5	30	1.4	62	1.4
Other race/ethnicity	105	4.8	111	5.2	216	5.0
Not reported	27	1.2	14	0.7	68	1.6
Total	2,169	100.0	2,141	100.0	4,337	100.0

* Includes respondents not reporting gender.

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Table 3. Survey respondents by paygrade and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

	Women		Men		Total *	
Paygrade	Number	Percent	Number	Percent	Number	Percent
E-1	75	3.7	45	2.2	120	3.0
E-2	240	11.8	202	10.0	442	10.9
E-3	384	18.9	377	18.8	761	18.8
E-4	597	29.4	512	25.5	1,109	27.4
E-5	416	20.5	419	20.8	835	20.6
E-6	231	11.4	344	17.1	575	14.2
E-7	71	3.5	86	4.3	157	3.9
E-8	17	0.8	16	0.8	33	0.8
E-9	3	0.1	9	0.4	12	0.3
Enlisted total	2,034	100.0	2,010	100.0	4,044	100.0
O-1	21	22.3	20	22.0	41	22.2
O-2	32	34.0	27	29.7	59	31.9
O-3	32	34.0	31	34.1	63	34.1
O-4	6	6.4	9	9.9	15	8.1
O-5	3	3.2	4	4.4	7	3.8
Officer total	94	100.0	91	100.0	185	100.0
W-1	0	0.0	0	0.0	0	0.0
W-2	3	0.0	0	0.0	3	0.0
W-3	0	0.0	0	0.0	0	0.0
W-4	1	0.0	0	0.0	1	0.0
Warrant total	4	0.0	0	0.0	4	0.0
Missing	37	0.0	40	0.0	77	0.0
Total	2,169	100.0	2,141	100.0	4,337	100.0

* Includes respondents not reporting gender

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Table 4. Survey respondents by number of years served aboard ship and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Number of years served aboard ship	Women		Men		Total *	
	Number	Percent	Number	Percent	Number	Percent
0 to 1	702	32.4	531	24.8	1,233	28.4
2 to 3	656	30.2	474	22.1	1,130	26.1
4 to 5	239	11.0	337	15.7	576	13.3
6 to 7	86	4.0	215	10.0	301	6.9
8 or more	31	1.4	333	15.6	364	8.4
Not reported	455	21.0	251	11.7	733	16.9
Total	2,169	100.0	2,141	100.0	4,337	100.0

* Includes respondents not reporting gender.

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Table 5. Survey respondents by number of previous deployments (30 days or more) and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Number of previous deployments	Women		Men		Total *	
	Number	Percent	Number	Percent	Number	Percent
None	2	0.1	2	0.1	4	0.1
1	453	20.9	296	13.8	749	17.3
2	281	13.0	238	11.1	519	12.0
3	161	7.4	230	10.7	391	9.0
4	137	6.3	148	6.9	285	6.6
5	83	3.8	118	5.5	201	4.6
6	57	2.6	120	5.6	177	4.1
7	27	1.2	66	3.1	93	2.1
8 +	166	7.7	423	19.8	589	13.6
Not reported	802	37.0	500	23.4	1,329	30.6
Total	2,169	100.0	2,141	100.0	4,337	100.0

* Includes respondents not reporting gender.

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Table 6. Survey respondents by marital status and gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

	Women		Men		Total *	
Marital status	Number	Percent	Number	Percent	Number	Percent
Never married	1,059	48.8	858	40.1	1,917	44.2
Married	755	34.8	1,110	51.8	1,865	43.0
Separated	153	7.1	74	3.5	227	5.2
Divorced	193	8.9	96	4.5	289	6.7
Widowed	5	0.2	0	0.0	5	0.1
Not reported	4	0.2	3	0.1	34	0.8
Total	2,169	100.0	2,141	100.0	4,337	100.0

* Includes respondents not reporting gender.

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Table 7. Number of children (natural, adopted, or stepchildren) under the age of 21 living in a household of a survey respondent, by age group of child and respondent gender, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

Age group	Women (N = 2,169)		Men (N = 2,141)		Total	
No. of children	Number	Percent	Number	Percent	Number	Percent
Under 6 Weeks						
0	1,058	99.3	1,007	96.9	2,065	98.1
1	5	0.5	28	2.7	33	1.6
2	2	0.2	3	0.3	5	0.2
3 or more	0	0.0	1	0.1	1	0.0
Total	1,065	0.7	1,039	3.1	2,104	1.9
6 Weeks to 1 Year						
0	1,040	97.7	958	92.2	1,998	95.0
1	25	2.3	77	7.4	102	4.8
2	0	0.0	3	0.3	3	0.1
3 or more	0	0.0	1	0.1	1	0.0
Total	1,065	2.3	1,039	7.8	2,104	5.0
12 to 23 Months						
0	992	93.1	960	92.4	1,952	92.8
1	71	6.7	73	7.0	144	6.8
2	2	0.2	5	0.5	7	0.3
3 or more	0	0.0	1	0.1	1	0.0
Total	1,065	6.9	1,039	7.6	2,104	7.2
24 to 35 Months						
0	996	93.5	965	92.9	1,961	93.2
1	68	6.4	71	6.8	139	6.6
2	1	0.1	3	0.3	4	0.2
3 or more	0	0.0	0	0.0	0	0.0
Total	1,065	100.0	1,039	100.0	2,104	100.0

Table 7. — Cont. — Number of children (natural, adopted, or stepchildren) under the age of 21 living in a household of a survey respondent, by age group of child and respondent gender, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

Age group / No. of children	Women		Men		Total	
	Number	Percent	Number	Percent	Number	Percent
3 to 5 years						
0	899	84.4	888	85.5	1,787	84.9
1	150	14.1	133	12.8	283	13.5
2	16	1.5	16	1.5	32	1.5
3 or more	0	0.0	2	0.2	2	0.1
Total	1,065	100.0	1,039	100.0	2,104	100.0
6 to 9 years						
0	947	88.9	889	85.6	1,836	87.3
1	98	9.2	116	11.2	214	10.2
2	17	1.6	31	3.0	48	2.3
3 or more	3	0.3	3	0.3	6	0.3
Total	1,065	100.0	1,039	100.0	2,104	100.0
10 to 12 years						
0	1,008	94.6	950	91.4	1,958	93.1
1	49	4.6	72	6.9	121	5.8
2	7	0.7	14	1.3	21	1.0
3 or more	1	0.1	3	0.3	4	0.2
Total	1,065	100.0	1,039	100.0	2,104	100.0
13 to 15 years						
0	1,003	96.9	974	93.7	1,977	95.3
1	29	2.8	54	5.2	83	4.0
2	3	0.3	11	1.1	14	0.7
3 or more	0	0.0	0	0.0	0	0.0
Total	1,035	100.0	1,039	100.0	2,074	100.0

Table 7. — Cont. — Number of children (natural, adopted, or stepchildren) under the age of 21 living in a household of a survey respondent, by age group of child and respondent gender, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

Age group	Women		Men		Total	
No. of children	Number	Percent	Number	Percent	Number	Percent
16 to 20 years						
0	1,037	97.4	996	95.9	2,033	96.6
1	24	2.3	31	3.0	55	2.6
2	4	0.4	9	0.9	13	0.6
3 or more	0	0.0	3	0.3	3	0.1
Total	1,065	100.0	1,039	100.0	2,104	100.0

All age groups	Women		Men		Total	
No. of children	Number	Percent	Number	Percent	Number	Percent
0	684	64.2	580	55.8	1,264	60.1
1	192	18.0	194	18.7	386	18.3
2	137	12.9	164	15.8	301	14.3
3 or more	52	4.9	101	9.7	153	7.3
Total	1,065	100.0	1,039	100.0	2,104	100.0

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PRELIMINARY REPORT

Table 8. Number of children (natural, adopted, or step children) under the age of 21 years living in households of naval personnel, by marital status, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

		Single †						Married					
Age group		Women (N=693)		Men (N=511)		Total (N=1204)		Women (N=372)		Men (N=528)		Total (N=900)	
	No. of children	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Under 6 Weeks													
	0 *	690	99.6	507	99.2	1,197	99.4	368	98.9	500	94.7	868	96.4
	1	3	0.4	4	0.8	7	0.6	2	0.5	24	4.5	26	2.9
	2	0	0.0	0	0.0	0	0.0	2	0.5	3	0.6	5	0.6
	3 or more	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	1	0.1
Total		693	100	511	100	1204	100	372	100	528	100	900	100
6 Weeks to 1 Year													
	0	683	98.6	502	98.2	1,185	98.4	357	96.0	456	86.4	813	90.3
	1	10	1.4	9	1.8	19	1.6	15	4.0	68	12.9	83	9.2
	2	0	0.0	0	0.0	0	0.0	0	0.0	3	0.6	3	0.3
	3 or more	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	1	0.1
Total		693	100	511	100	1204	100	372	100	528	100	900	100
12 to 23 Months													
	0	668	96.4	499	97.7	1,167	96.9	325	87.4	461	87.3	786	87.3
	1	24	3.5	11	2.2	35	2.9	46	12.4	62	11.7	108	12.0
	2	1	0.1	1	0.2	2	0.2	1	0.3	4	0.8	5	0.6
	3 or more	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	1	0.1
Total		693	100	511	100	1204	100	372	100	528	100	900	100
24 to 35 Months													
	0	658	94.9	496	97.1	1,154	95.8	339	91.1	469	88.8	808	89.8
	1	35	5.1	15	2.9	50	4.2	32	8.6	56	10.6	88	9.8
	2	0	0.0	0	0.0	0	0.0	1	0.3	3	0.6	4	0.4
	3 or more	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total		693	100	511	100	1204	100	372	100	528	100	900	100

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PRELIMINARY REPORT

Table 8. — *Continued* — Number of children (natural, adopted, or step children) under the age of 21 years living in households of naval personnel, by marital status, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

		Single †						Married					
Age group		Women (N=693)		Men (N=511)		Total (N=1204)		Women (N=372)		Men (N=528)		Total (N=900)	
	No. of children	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
3 to 5 Years													
	0	621	89.6	487	95.3	1,108	92.0	278	74.7	401	75.9	679	75.4
	1	65	9.4	21	4.1	86	7.1	85	22.8	112	21.2	197	21.9
	2	7	1.0	3	0.6	10	0.8	9	2.4	13	2.5	22	2.4
	3 or more	0	0.0	0	0.0	0	0.0	0	0.0	2	0.4	2	0.2
	Total	693	100	511	100	1204	100	372	100	528	100	900	100
6 to 9 Years													
	0	641	92.5	487	95.3	1,128	93.7	306	82.3	402	76.1	708	78.7
	1	45	6.5	19	3.7	64	5.3	53	14.2	97	18.4	150	16.7
	2	4	0.6	5	1.0	9	0.7	13	3.5	26	4.9	39	4.3
	3 or more	3	0.4	0	0.0	3	0.2	0	0.0	3	0.6	3	0.3
	Total	693	100	511	100	1204	100	372	100	528	100	900	100
10 to 12 Years													
	0	671	96.8	498	97.5	1,169	97.1	338	90.9	452	85.6	790	87.8
	1	20	2.9	9	1.8	29	2.4	28	7.5	63	11.9	91	10.1
	2	2	0.3	4	0.8	6	0.5	5	1.3	10	1.9	15	1.7
	3 or more	0	0.0	0	0.0	0	0.0	1	0.3	3	0.6	4	0.4
	Total	693	100	511	100	1204	100	372	100	528	100	900	100
13 to 15 Years													
	0	681	98.3	504	98.6	1,185	98.4	352	94.6	470	89.0	822	91.3
	1	10	1.4	6	1.2	16	1.3	19	5.1	48	9.1	67	7.4
	2	2	0.3	1	0.2	3	0.2	1	0.3	10	1.9	11	1.2
	3 or more	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Total	693	100	511	100	1204	100	372	100	528	100	900	100

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PRELIMINARY REPORT

Table 8. — *Continued* — Number of children (natural, adopted, or step children) under the age of 21 years living in households of naval personnel, by marital status, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

Age group	No. of children	Single †						Married					
		Women (N=693)		Men (N=511)		Total (N=1204)		Women (N=372)		Men (N=528)		Total (N=900)	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
16 to 20 Years													
	0	684	98.7	501	98.0	1,185	98.4	353	94.9	495	93.8	848	94.2
	1	8	1.2	8	1.6	16	1.3	16	4.3	23	4.4	39	4.3
	2	1	0.1	2	0.4	3	0.2	3	0.8	7	1.3	10	1.1
	3 or more	0	0.0	0	0.0	0	0.0	0	0.0	3	0.6	3	0.3
Total		693	100	511	100	1204	100	372	100	528	100	900	100
All age groups													
	0	524	75.6	433	84.7	957	79.5	163	43.8	147	27.8	310	34.4
	1	99	14.3	41	8.0	140	11.6	90	24.2	153	29.0	243	27.0
	2	52	7.5	26	5.1	78	6.5	85	22.8	138	26.1	223	24.8
	3 or more	18	2.6	11	2.2	29	2.4	34	9.1	90	17.0	124	13.8
Total		693	100	511	100	1,204	100	372	100	528	100	900	100

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PRELIMINARY REPORT

Table 8. — *Continued* — Number of children (natural, adopted, or step children) under the age of 21 years living in households of naval personnel, by marital status, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

Age group	No. of children	Total (Single † and Married)					
		Women (N=1,065)		Men (N=1,039)		Total (N=2,104)	
		No.	Percent	No.	Percent	No.	Percent
Under 6 Weeks							
	0	1,058	99.3	1,007	96.9	2,065	98.1
	1	5	0.5	28	2.7	33	1.6
	2	2	0.2	3	0.3	5	0.2
	3 or more	0	0.0	1	0.1	1	0.0
	Total	1,065	100	1,039	100	2,104	100
6 Weeks to 1 Year							
	0	1,040	97.7	958	92.2	1,998	95.0
	1	25	2.3	77	7.4	102	4.8
	2	0	0.0	3	0.3	3	0.1
	3 or more	0	0.0	1	0.1	1	0.0
	Total	1,065	100	1,039	100	2,104	100
12 to 23 Months							
	0	993	93.2	960	92.4	1,953	92.8
	1	70	6.6	73	7.0	143	6.8
	2	2	0.2	5	0.5	7	0.3
	3 or more	0	0.0	1	0.1	1	0.0
	Total	1,065	100	1,039	100	2,104	100
24 to 35 Months							
	0	997	93.6	965	92.9	1,962	93.3
	1	67	6.3	71	6.8	138	6.6
	2	1	0.1	3	0.3	4	0.2
	3 or more	0	0.0	0	0.0	0	0.0
	Total	1,065	100	1,039	100	2,104	100

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PRELIMINARY REPORT

Table 8. — *Continued* — Number of children (natural, adopted, or step children) under the age of 21 years living in households of naval personnel, by marital status, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

Age group		Total (Single † and Married)					
		Women (N=1,065)		Men (N=1,039)		Total (N=2,104)	
	No. of children	No.	Percent	No.	Percent	No.	Percent
3 to 5 Years							
	0	899	84.4	888	85.5	1,787	84.9
	1	150	14.1	133	12.8	283	13.5
	2	16	1.5	16	1.5	32	1.5
	3 or more	0	0.0	2	0.2	2	0.1
Total		1,065	100	1,039	100	2,104	100
6 to 9 Years							
	0	947	88.9	889	85.6	1,836	87.3
	1	98	9.2	116	11.2	214	10.2
	2	17	1.6	31	3.0	48	2.3
	3 or more	3	0.3	3	0.3	6	0.3
Total		1,065	100	1,039	100	2,104	100
10 to 12 Years							
	0	1,009	94.7	950	91.4	1,959	93.1
	1	48	4.5	72	6.9	120	5.7
	2	7	0.7	14	1.3	21	1.0
	3 or more	1	0.1	3	0.3	4	0.2
Total		1,065	100	1,039	100	2,104	100
13 to 15 Years							
	0	1,033	97.0	974	93.7	2,007	95.4
	1	29	2.7	54	5.2	83	3.9
	2	3	0.3	11	1.1	14	0.7
	3 or more	0	0.0	0	0.0	0	0.0
Total		1,065	100	1,039	100	2,104	100

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PRELIMINARY REPORT

Table 8. — *Continued* — Number of children (natural, adopted, or step children) under the age of 21 years living in households of naval personnel, by marital status, US Navy Women Aboard Ship Study 15 November 1994 to 30 October 1995

Age group	Total (Single † and Married)					
	Women (N=1,065)		Men (N=1,039)		Total (N=2,104)	
No. of children	No.	Percent	No.	Percent	No.	Percent
16 to 20 Years						
0	1,037	97.4	996	95.9	2,033	96.6
1	24	2.3	31	3.0	55	2.6
2	4	0.4	9	0.9	13	0.6
3 or more	0	0.0	3	0.3	3	0.1
Total	1,065	100	1,039	100	2,104	100
All age groups						
0	687	64.5	580	55.8	1,267	60.2
1	189	17.7	194	18.7	383	18.2
2	137	12.9	164	15.8	301	14.3
3 or more	52	4.9	101	9.7	153	7.3
Total	1,065	100	1,039	100	2,104	100

† Includes single parents (either never married, separated, divorced, or widowed)
* Zero values for all age groups include survey respondents who are assumed not to have children by a null response

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Table 9. Personnel reporting being medically screened prior to deployment, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Were you medically screened preceding this deployment? **	Women		Men		Total *	
	No.	Percent	No.	Percent	No.	Percent
Yes	61	15.9	70	16.4	131	16.1
No	323	84.1	358	83.6	681	83.9
Total	384	100	428	100	812	100

* Includes only personnel currently deployed.
** Deployment is defined as a ship scheduled at sea for 30 days or more.

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Table 10. Self-reported medical conditions during the past 30 days whether or not they resulted in a sick call visit, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

	Women (N = 2169)					
	Had Condition		Didn't Have Condition		Not reported	
Condition	Number	Percent	Number	Percent	Number	Percent
Muscle sprain or strain	1,623	74.8	456	21.0	90	4.1
Headache	1,474	68.0	657	30.3	38	1.8
Common cold symptoms	1,135	52.3	989	45.6	45	2.1
Cough	864	39.8	1,239	57.1	66	3.0
Sore throat	821	37.9	1,279	59.0	69	3.2
Sinus trouble	775	35.7	1,319	60.8	75	3.5
Pain in stomach or abdominal area	766	35.3	1,333	61.5	70	3.2
Back problems	652	30.1	1,442	66.5	75	3.5
Stomach problems	567	26.1	1,523	70.2	79	3.6
Irritated eyes	517	23.8	1,570	72.4	82	3.8
Dizziness	513	23.7	1,578	72.8	78	3.6
Nausea / vomiting	483	22.3	1,594	73.5	92	4.2
Fever	455	21.0	1,635	75.4	79	3.6
Skin problems	444	20.5	1,649	76.0	76	3.5
Indigestion	424	19.5	1,645	75.8	100	4.6
Chills	383	17.7	1,698	78.3	88	4.1
Constipation	372	17.2	1,710	78.8	87	4.0
Shortness of breath	310	14.3	1,769	81.6	90	4.1
Hoarseness	254	11.7	1,823	84.0	92	4.2
Hay fever	227	10.5	1,845	85.1	97	4.5
Trouble seeing with one or both eyes even if wearing glasses or contacts	219	10.1	1,853	85.4	97	4.5
Hearing problems	200	9.2	1,878	86.6	91	4.2
Diarrhea lasting at least 3 days	194	8.9	1,880	86.7	95	4.4
Flu	179	8.3	1,890	87.1	100	4.6

Table 10. — *Cont.* — Self-reported medical conditions during the past 30 days whether or not they resulted in a sick call visit, by gender, US Navy women Aboard Ship Study, 15 November 1994 to 30 October 1995

	Men (N = 2,141)					
	Had Condition		Didn't Have Condition		Not reported	
Condition	Number	Percent	Number	Percent	Number	Percent
Headache	1,058	49.4	1,037	48.4	46	2.1
Common cold symptoms	948	44.3	1,177	55.0	16	0.7
Cough	722	33.7	1,383	64.6	36	1.7
Sore throat	620	29.0	1,479	69.1	42	2.0
Sinus trouble	600	28.0	1,497	69.9	44	2.1
Back problems	511	23.9	1,582	73.9	48	2.2
Muscle sprain or strain	409	19.1	1,669	78.0	63	2.9
Irritated eyes	360	16.8	1,723	80.5	58	2.7
Indigestion	324	15.1	1,757	82.1	60	2.8
Skin problems	317	14.8	1,764	82.4	60	2.8
Stomach problems	307	14.3	1,776	83.0	58	2.7
Fever	303	14.2	1,785	83.4	53	2.5
Pain in stomach or abdominal area	299	14.0	1,774	82.9	68	3.2
Dizziness	256	12.0	1,819	85.0	66	3.1
Hearing problems	231	10.8	1,848	86.3	62	2.9
Chills	228	10.6	1,850	86.4	63	2.9
Hay fever	203	9.5	1,872	87.4	66	3.1
Shortness of breath	185	8.6	1,891	88.3	65	3.0
Flu	170	7.9	1,906	89.0	65	3.0
Diarrhea lasting at least 3 days	154	7.2	1,924	89.9	63	2.9
Nausea / vomiting	146	6.8	1,928	90.1	67	3.1
Trouble seeing with one or both eyes even if wearing glasses or contacts	135	6.3	1,937	90.5	69	3.2
Hoarseness	132	6.2	1,943	90.8	66	3.1
Constipation	117	5.5	1,958	91.5	66	3.1

Table 10. — *Cont.* — Self-reported medical conditions during the past 30 days whether or not they resulted in a sick call visit, by gender, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

	Women and Men (N = 4,310)					
	Had Condition		Didn't Have Condition		Not reported	
Condition	Number	Percent	Number	Percent	Number	Percent
Headache	2,532	58.7	1,694	39.3	84	1.9
Common cold symptoms	2,083	48.3	2,166	50.3	61	1.4
Muscle sprain or strain	2,032	47.1	2,125	49.3	153	3.5
Cough	1,586	36.8	2,622	60.8	102	2.4
Sore throat	1,441	33.4	2,758	64.0	111	2.6
Sinus trouble	1,375	31.9	2,816	65.3	119	2.8
Back problems	1,163	27.0	3,024	70.2	123	2.9
Pain in stomach or abdominal area	1,065	24.7	3,107	72.1	138	3.2
Irritated eyes	877	20.3	3,293	76.4	140	3.2
Stomach problems	874	20.3	3,299	76.5	137	3.2
Dizziness	769	17.8	3,397	78.8	144	3.3
Skin problems	761	17.7	3,413	79.2	136	3.2
Fever	758	17.6	3,420	79.4	132	3.1
Indigestion	748	17.4	3,402	78.9	160	3.7
Nausea / vomiting	629	14.6	3,522	81.7	159	3.7
Chills	611	14.2	3,548	82.3	151	3.5
Shortness of breath	495	11.5	3,660	84.9	155	3.6
Constipation	489	11.3	3,668	85.1	153	3.5
Hearing problems	431	10.0	3,726	86.5	153	3.5
Hay fever	430	10.0	3,717	86.2	163	3.8
Hoarseness	386	9.0	3,766	87.4	158	3.7
Trouble seeing with one or both eyes even if wearing glasses or contacts	354	8.2	3,790	87.9	166	3.9
Flu	349	8.1	3,796	88.1	165	3.8
Diarrhea lasting at least 3 days	348	8.1	3,804	88.3	158	3.7

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PRELIMINARY REPORT

Table 11. Availability of counseling during the past 30 days according to respondent, by gender, personnel aboard 22 U.S. Navy ships, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Type of counseling *	Strongly agree				Agree				Neither agree or disagree				Disagree				Strongly disagree			
	Men		Women		Men		Women		Men		Women		Men		Women		Men		Women	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Alcohol abuse	110	18.3	98	15.8	227	37.7	182	29.3	114	18.9	139	22.4	33	18.9	28	4.5	25	4.2	53	8.5
b. Birth control methods	91	15.4	117	18.8	208	35.3	206	33.1	123	20.9	125	20.1	28	20.9	26	4.2	31	5.3	50	8.0
c. Drug abuse	103	17.2	91	14.6	223	37.2	187	30.1	121	20.2	137	22.0	31	20.2	31	5.0	27	4.5	51	8.2
d. Family planning	90	15.0	74	11.9	203	33.8	179	28.8	143	23.8	155	25.0	50	23.8	44	7.1	29	4.8	54	8.7
e. Medical concerns	100	16.6	79	12.8	236	39.2	214	34.8	138	22.9	140	22.8	38	22.9	54	8.8	22	3.7	55	8.9
f. Quitting smoking	80	13.3	73	11.8	185	30.8	164	26.4	146	24.3	166	26.7	41	24.3	41	6.6	40	6.7	54	8.7
g. Stress management	92	15.3	67	10.8	193	32.0	178	28.8	145	24.0	150	24.3	55	24.0	64	10.4	39	6.5	71	11.5
h. Weight control	90	15.0	66	10.7	183	30.4	172	27.8	149	24.8	148	23.9	45	24.8	70	11.3	40	6.7	66	10.7

* This table presents answers to the following question:
"During the past 30 days, I felt counseling was readily available to me on: (type of counseling)"

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PRELIMINARY REPORT

Table 11 —*Continued*— Availability of counseling during the past 30 days according to respondent, by gender, personnel aboard 22 U.S. Navy ships, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Type of counseling *	Not applicable				Did not answer				Total			
	Men		Women		Men		Women		Men		Women	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Alcohol abuse	93	15.4	121	19.5	55	9.1	27	4.3	657	100.0	648	100.0
b. Birth control methods	108	18.3	98	15.8	68	11.5	26	4.2	657	100.0	648	100.0
c. Drug abuse	95	15.8	125	20.1	57	9.5	26	4.2	657	100.0	648	100.0
d. Family planning	86	14.3	115	18.5	56	9.3	27	4.3	657	100.0	648	100.0
e. Medical concerns	68	11.3	73	11.9	55	9.1	33	5.4	657	100.0	648	100.0
f. Quitting smoking	108	18.0	123	19.8	57	9.5	27	4.3	657	100.0	648	100.0
g. Stress management	79	13.1	88	14.2	54	9.0	30	4.9	657	100.0	648	100.0
h. Weight control	94	15.6	97	15.7	56	9.3	29	4.7	657	100.0	648	100.0

* This table presents answers to the following question:
"During the past 30 days, I felt counseling was readily available to me on: (type of counseling)"

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Table 12. Availability of gynecological supplies, US Navy Women Aboard Ship Study, 15 November 1994 to 30 October 1995

Supplies*	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Did not need		Did not respond	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
a. Birth control pills	687	31.7	424	19.5	136	6.3	54	2.5	55	2.5	657	30.3	156	7.2
b. Depo-Provera, Norplant	530	24.4	324	14.9	209	9.6	46	2.1	44	2.0	853	39.3	163	7.5
c. Condoms	715	33.0	394	18.2	126	5.8	20	0.9	21	1.0	733	33.8	160	7.4
d Diaphragm	287	13.2	242	11.2	359	16.6	46	2.1	29	1.3	1,025	47.3	181	8.3
e. Pregnancy testing or test kit	551	25.4	366	16.9	170	7.8	33	1.5	29	1.3	848	39.1	172	7.9
f. Family planning information	372	17.2	321	14.8	320	14.8	60	2.8	32	1.5	881	40.6	183	8.4
g. Appropriately staffed and equipped Ob/Gyn medical support	375	17.3	357	16.5	332	15.3	205	9.5	220	10.1	508	23.4	172	7.9

* This table presents answers to the following question from 2,169 women:
"During the past 30 days, the following were readily available to me from the ship's medical department"

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PRELIMINARY REPORT

Table 13. Self-reported occupational exposures, by gender, US Navy women aboard ship study, 15 November 1994 to 30 October 1995

Occupational exposures	Women (N = 2,169)							
	Exposed		Not exposed		Uncertain		Not reported	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Adhesives or gluing compounds	445	20.5	1,523	70.2	139	6.4	62	2.9
Asbestos (loose)	177	8.2	1,637	75.5	313	14.4	42	1.9
Carbon monoxide	148	6.8	1,751	80.7	210	9.7	60	2.8
Diesel exhaust within 50 feet	317	14.6	1,646	75.9	166	7.7	40	1.8
Diesel fuel within 50 feet	299	13.8	1,674	77.2	154	7.1	42	1.9
Dry cleaning solvent	251	11.6	1,775	81.8	100	4.6	43	2.0
Exhaust from gasoline engine	381	17.6	1,620	74.7	121	5.6	47	2.2
Gasoline (liquid or vapor)	455	21.0	1,558	71.8	104	4.8	52	2.4
Guided missile fuel	18	0.8	2,030	93.6	71	3.3	50	2.3
High temperature (above 95 degrees F)	913	42.1	1,160	53.5	50	2.3	46	2.1
Hypodermic needles (used)	118	5.4	1,965	90.6	37	1.7	49	2.3
Insecticides	185	8.5	1,846	85.1	93	4.3	45	2.1
Jet exhaust within 50 feet	33	1.5	2,057	94.8	44	2.0	35	1.6
Jet fuel within 50 feet	80	3.7	1,997	92.1	49	2.3	43	2.0
Lifting 25 to 49 pounds	1,154	53.2	941	43.4	34	1.6	40	1.8
Lifting 50 or more pounds	608	28.0	1,434	66.1	67	3.1	60	2.8
Loud noise (such as jets)	638	29.4	1,447	66.7	36	1.7	48	2.2
Low temperature (below 32 degrees F)	204	9.4	1,885	86.9	36	1.7	44	2.0
Metal scrapings or filings	324	41.2	324	41.2	70	8.9	68	8.7

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PRELIMINARY REPORT

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Table 13. —*Continued*— Self-reported occupational exposures, by gender, US Navy women aboard ship study, 15 November 1994 to 30 October 1995

Occupational exposures	Men (N = 2,141)							
	Exposed		Not exposed		Uncertain		Not reported	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Adhesives or gluing compounds	685	32.0	1,289	60.2	109	5.1	58	2.7
Asbestos (loose)	293	13.7	1,487	69.5	312	14.6	49	2.3
Carbon monoxide	319	14.9	1,555	72.6	199	9.3	68	3.2
Diesel exhaust within 50 feet	478	22.3	1,465	68.4	142	6.6	56	2.6
Diesel fuel within 50 feet	425	19.9	1,532	71.6	130	6.1	54	2.5
Dry cleaning solvent	367	17.1	1,636	76.4	87	4.1	51	2.4
Exhaust from gasoline engine	591	27.6	1,373	64.1	113	5.3	64	3.0
Gasoline (liquid or vapor)	568	26.5	1,426	66.6	90	4.2	57	2.7
Guided missile fuel	26	1.2	2,000	93.4	54	2.5	61	2.8
High temperature (above 95 degrees F)	1,061	49.6	980	45.8	50	2.3	50	2.3
Hypodermic needles (used)	105	4.9	1,933	90.3	42	2.0	61	2.8
Insecticides	191	8.9	1,816	84.8	82	3.8	52	2.4
Jet exhaust within 50 feet	74	3.5	1,983	92.6	32	1.5	52	2.4
Jet fuel within 50 feet	117	5.5	1,941	90.7	32	1.5	51	2.4
Lifting 25 to 49 pounds	1,421	66.4	632	29.5	34	1.6	54	2.5
Lifting 50 or more pounds	1,191	55.6	830	38.8	48	2.2	72	3.4
Loud noise (such as jets)	729	34.0	1,301	60.8	42	2.0	69	3.2
Low temperature (below 32 degrees F)	312	14.6	1,743	81.4	26	1.2	60	2.8
Metal scrapings or filings	524	24.5	1,485	69.4	59	2.8	73	3.4

PRELIMINARY REPORT

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Table 13. *—Continued—* Self-reported occupational exposures, by gender, US Navy women aboard ship study, 15 November 1994 to 30 October 1995

Occupational exposures	Women (N = 2,169)							
	Exposed		Not exposed		Uncertain		Not reported	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Microwave oven within 3 feet	956	44.1	1,132	52.2	35	1.6	46	2.1
Paint (oil based, or thinner)	775	35.7	1,284	59.2	63	2.9	47	2.2
Paint, other or unknown type	657	30.3	1,369	63.1	87	4.0	56	2.6
Paint scrapings or paint sanding	638	29.4	1,426	65.7	49	2.3	56	2.6
Radar antenna or array within 50 feet	183	8.4	1,772	81.7	160	7.4	54	2.5
Solvent or degreaser	443	20.4	1,588	73.2	95	4.4	43	2.0
Torpedo fuel	25	1.2	2,041	94.1	53	2.4	50	2.3
Transmitting antenna within 50 feet	125	5.8	1,838	84.7	161	7.4	45	2.1
Nuclear reactor within 50 feet	55	2.5	1,983	91.4	88	4.1	43	2.0
Nuclear fuel within 50 feet	18	0.8	2,005	92.4	104	4.8	42	1.9
Nuclear ordnance within 50 feet	33	1.5	1,971	90.9	116	5.3	49	2.3
Nuclear medicines (radioisotopes)	27	1.2	1,990	91.7	97	4.5	55	2.5
Video display terminal (VDT, CRT)	408	18.8	1,588	73.2	116	5.3	57	2.6
Welding fumes	381	17.6	1,662	76.6	69	3.2	57	2.6
Dust or particles	1,072	49.4	971	44.8	72	3.3	54	2.5
Explosives (nonnuclear) within 50 feet	141	6.5	1,878	86.6	93	4.3	57	2.6
Nitrous oxide	20	0.9	1,918	88.4	179	8.3	52	2.4
Ethylene dibromide (EDB)	10	0.5	1,897	87.5	218	10.1	44	2.0
Perchlorethylene (PERC)	18	0.8	1,889	87.1	214	9.9	48	2.2

PRELIMINARY REPORT

Table 13. —*Continued*— Self-reported occupational exposures, by gender, US Navy women aboard ship study, 15 November 1994 to 30 October 1995

Occupational exposures	Men (N = 2,141)							
	Exposed		Not exposed		Uncertain		Not reported	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Microwave oven within 3 feet	897	41.9	1,138	53.2	52	2.4	54	2.5
Paint (oil based, or thinner)	886	41.4	1,129	52.7	68	3.2	58	2.7
Paint, other or unknown type	652	30.5	1,321	61.7	113	5.3	55	2.6
Paint scrapings or paint sanding	760	35.5	1,251	58.4	64	3.0	66	3.1
Radar antenna or array within 50 feet	271	12.7	1,664	77.7	140	6.5	66	3.1
Solvent or degreaser	600	28.0	1,406	65.7	79	3.7	56	2.6
Torpedo fuel	30	1.4	2,000	93.4	50	2.3	61	2.8
Transmitting antenna within 50 feet	191	8.9	1,734	81.0	157	7.3	59	2.8
Nuclear reactor within 50 feet	182	8.5	1,848	86.3	68	3.2	43	2.0
Nuclear fuel within 50 feet	70	3.3	1,939	90.6	81	3.8	51	2.4
Nuclear ordnance within 50 feet	61	2.8	1,939	90.6	90	4.2	51	2.4
Nuclear medicines (radioisotopes)	32	1.5	1,959	91.5	96	4.5	54	2.5
Video display terminal (VDT, CRT)	461	21.5	1,507	70.4	112	5.2	61	2.8
Welding fumes	571	26.7	1,459	68.1	57	2.7	54	2.5
Dust or particles	1,039	48.5	947	44.2	91	4.3	64	3.0
Explosives (nonnuclear) within 50 feet	237	11.1	1,786	83.4	69	3.2	49	2.3
Nitrous oxide	41	1.9	1,888	88.2	160	7.5	52	2.4
Ethylene dibromide (EDB)	14	0.7	1,839	85.9	238	11.1	50	2.3
Perchlorethylene (PERC)	15	0.7	1,829	85.4	243	11.3	54	2.5

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Table 14. Availability of protective gear for use in current job, by gender, US Navy women aboard ship study 15 November 1994 to 30 October 1995

Protective Gear	Women															
	Is this item available?								Does it fit you properly?							
	No		Yes		Sometimes		Did not answer		No		Yes		Sometimes		Did not answer	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Gloves	213	9.8	1,602	73.9	237	10.9	117	5.4	240	11.1	1,104	50.9	284	13.1	541	24.9
Respirator or mask	302	13.9	1,596	73.6	122	5.6	149	6.9	109	5.0	1,325	61.1	86	4.0	649	29.9
Protective gloves	272	12.5	1,550	71.5	181	8.3	166	7.7	261	12.0	1,038	47.9	229	10.6	641	29.6
Boots	344	15.9	1,566	72.2	83	3.8	176	8.1	203	9.4	1,177	54.3	117	5.4	672	31.0
Ear plugs	151	7.0	1,804	83.2	80	3.7	134	6.2	49	2.3	1,524	70.3	50	2.3	546	25.2
Film Badges	1,075	49.6	541	24.9	87	4.0	466	21.5	382	17.6	430	19.8	64	3.0	1,293	59.6
Hazardous material suit	790	36.4	959	44.2	105	4.8	315	14.5	364	16.8	568	26.2	152	7.0	1,085	50.0
Fire fighting suit	513	23.7	1,369	63.1	57	2.6	230	10.6	456	21.0	630	29.0	219	10.1	864	39.8

Protective Gear	Do you wear it when needed?								Does it seriously interfere with your ability to do your work?							
	No		Yes		Sometimes		Did not answer		No		Yes		Sometimes		Did not answer	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Gloves	55	2.5	1,388	64.0	191	8.8	535	24.7	946	43.6	187	8.6	476	21.9	560	25.8
Respirator or mask	108	5.0	1,295	59.7	121	5.6	645	29.7	1,129	52.1	130	6.0	230	10.6	680	31.4
Protective gloves	77	3.6	1,300	59.9	149	6.9	643	29.6	921	42.5	196	9.0	379	17.5	673	31.0
Boots	83	3.8	1,365	62.9	50	2.3	671	30.9	1,219	56.2	125	5.8	126	5.8	699	32.2
Ear plugs	55	2.5	1,458	67.2	117	5.4	539	24.9	1,373	63.3	108	5.0	113	5.2	575	26.5
Film Badges	362	16.7	496	22.9	40	1.8	1,271	58.6	784	36.1	39	1.8	64	3.0	1,282	59.1
Hazardous material suit	246	11.3	772	35.6	69	3.2	1,082	49.9	813	37.5	109	5.0	153	7.1	1,094	50.4
Fire fighting suit	143	6.6	1,122	51.7	34	1.6	870	40.1	757	34.9	282	13.0	246	11.3	884	40.8

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Table 14. — *Continued* — Availability of protective gear for use in current job, by gender, US Navy women aboard ship study
15 November 1994 - 30 October 1995

Men

Protective Gear	Is this item available?								Does it fit you properly?							
	No		Yes		Sometimes		Did not answer		No		Yes		Sometimes		Did not answer	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Gloves	136	6.4	1,723	80.5	217	10.1	65	3.0	99	4.6	1,399	65.3	252	11.8	391	18.3
Respirator or mask	180	8.4	1,740	81.3	140	6.5	81	3.8	51	2.4	1,564	73.0	82	3.8	444	20.7
Protective gloves	177	8.3	1,701	79.4	185	8.6	78	3.6	104	4.9	1,397	65.2	194	9.1	446	20.8
Boots	312	14.6	1,651	77.1	87	4.1	91	4.3	126	5.9	1,406	65.7	101	4.7	508	23.7
Ear plugs	79	3.7	1,910	89.2	75	3.5	77	3.6	33	1.5	1,689	78.9	36	1.7	383	17.9
Film Badges	1,019	47.6	736	34.4	90	4.2	296	13.8	390	18.2	632	29.5	64	3.0	1,055	49.3
Hazardous material suit	680	31.8	1,146	53.5	120	5.6	195	9.1	297	13.9	864	40.4	117	5.5	863	40.3
Fire fighting suit	372	17.5	1,568	73.9	56	2.6	127	6.0	261	12.2	1,023	47.8	229	10.7	628	29.3

Protective Gear	Do you wear it when needed?								Does it seriously interfere with your ability to do your work?							
	No		Yes		Sometimes		Did not answer		No		Yes		Sometimes		Did not answer	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Gloves	55	2.6	1,490	69.6	196	9.2	400	18.7	980	45.8	216	10.1	538	25.1	407	19.0
Respirator or mask	55	2.6	1,474	68.8	154	7.2	458	21.4	1,201	56.1	173	8.1	293	13.7	474	22.1
Protective gloves	54	2.5	1,453	67.9	169	7.9	465	21.7	999	46.7	229	10.7	440	20.6	473	22.1
Boots	76	3.5	1,481	69.2	58	2.7	526	24.6	1,339	62.5	135	6.3	130	6.1	537	25.1
Ear plugs	39	1.8	1,580	73.8	120	5.6	402	18.8	1,471	68.7	127	5.9	124	5.8	419	19.6
Film Badges	368	17.2	663	31.0	53	2.5	1,057	49.4	914	42.7	68	3.2	81	3.8	1,078	50.4
Hazardous material suit	243	11.3	962	44.9	69	3.2	867	40.5	945	44.1	142	6.6	172	8.0	882	41.2
Fire fighting suit	129	6.0	1,314	61.4	50	2.3	648	30.3	912	42.6	304	14.2	265	12.4	660	30.8

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Table 14. — *Continued* — Availability of protective gear for use in current job, by gender, US Navy women aboard ship study
15 November 1994 - 30 October 1995

Women and men

Protective Gear	Is this item available?								Does it fit you properly?							
	No		Yes		Sometimes		Did not answer		No		Yes		Sometimes		Did not answer	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Gloves	349	8.1	3,325	77.1	454	10.5	182	4.2	339	7.9	2,503	58.1	536	12.4	932	21.6
Respirator or mask	482	11.2	3,336	77.4	262	6.1	230	5.3	160	3.7	2,889	67.0	168	3.9	1,093	25.4
Protective gloves	449	10.4	3,251	75.4	366	8.5	244	5.7	365	8.5	2,435	56.5	423	9.8	1,087	25.2
Boots	656	15.2	3,217	74.6	170	3.9	267	6.2	329	7.6	2,583	59.9	218	5.1	1,180	27.4
Ear plugs	230	5.3	3,714	86.2	155	3.6	211	4.9	82		3,213	74.5	86	2.0	929	21.6
Film Badges	2,094	48.6	1,277	29.6	177	4.1	762	17.7	772	17.9	1,062	24.6	128	3.0	2,348	54.5
Hazardous material suit	1,470	34.1	2,105	48.8	225	5.2	510	11.8	661	15.3	1,432	33.2	269	6.2	1,948	45.2
Fire fighting suit	885	20.6	2,937	68.4	113	2.6	357	8.3	717	16.6	1,653	38.4	448	10.4	1,492	34.6

Protective Gear	Do you wear it when needed?								Does it seriously interfere with your ability to do your work?							
	No		Yes		Sometimes		Did not answer		No		Yes		Sometimes		Did not answer	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Gloves	110	2.6	2,878	66.8	387	9.0	935	21.7	1,926	44.7	403	9.4	1,014	23.5	967	22.4
Respirator or mask	163	3.8	2,769	64.2	275	6.4	1,103	25.6	2,330	54.1	303	7.0	523	12.1	1,154	26.8
Protective gloves	131	3.0	2,753	63.9	318	7.4	1,108	25.7	1,920	44.5	425	9.9	819	19.0	1,146	26.6
Boots	159	3.7	2,846	66.0	108	2.5	1,197	27.8	2,558	59.4	260	6.0	256	5.9	1,236	28.7
Ear plugs	94	2.2	3,038	70.5	237	5.5	941	21.8	2,844	66.0	235	5.5	237	5.5	994	23.1
Film Badges	730	16.9	1,159	26.9	93	2.2	2,328	54.0	1,698	39.4	107	2.5	145	3.4	2,360	54.8
Hazardous material suit	489	11.3	1,734	40.2	138	3.2	1,949	45.2	1,758	40.8	251	5.8	325	7.5	1,976	45.8
Fire fighting suit	272	6.3	2,436	56.5	84	1.9	1,518	35.2	1,669	38.7	586	13.6	511	11.9	1,544	35.8

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Table 15. Number and percent of women who reported requesting a gynecological appointment prior to deployment

Appointment requested	Women	
	Number	Percent
Yes	161	11.8
No	1203	88.2
Total	1364	100.0

This table pertains to the following question: "Did you request a pre-deployment appointment with a gynecologist or obstetrician from a Navy medical facility prior to this deployment?"

Table 16. Number and percent of women requesting a gynecological appointment prior to deployment who reported receiving one.

Received requested appointment	Women	
	Number	Percent
Yes	133	82.6
No	22	13.7
Not Reported	6	3.7
Total	161	100.0

This table pertains to the following question: "Were you given a gynecological or obstetrical appointment ?"

APPENDIX G.2

Gender Differences in Health Conditions Among Navy Personnel

Deborah L. Wingard, Ph.D., and Donna Kritz-Silverstein, Ph.D.

REPORT TOPIC AREA: GENDER DIFFERENCES IN HEALTH CONDITIONS AMONG NAVY PERSONNEL

LEAD AUTHORS: Deborah L. Wingard, Ph.D., and Donna Kritz-Silverstein, Ph.D.

ABSTRACT

Self-reported conditions during the past 30 days were ascertained from men and women aboard 22 ships. Men were matched to the women on work division, department, race, pay grade, occupational rating, and date of birth. Women had significantly higher prevalence rats than men of all conditions except hearing problems and muscle strains and sprains. Common conditions in both genders included upper respiratory symptoms, which were reported by 53% of women and 45% of men, and sinusitis, reported by 37% of women and 29% of men. Migraines were reported by 20% of women and 10% of men, other headaches by 70% of women and 50% of men. Muscle and back symptoms were reported by 20% of both genders. The highest odds ratios for women compared to men were for nausea and vomiting (OR=4.0, 95% CI 3.2-4.8), constipation (OR=3.7, 95% CI 3.0-4.6), dizziness (OR=2.3, 95% CI 2.0-2.8), migraines (OR=2.4, 95% CI 2.0-2.8), and other headaches (OR=2.2, 95% CI 2.0-2.8). There were few significant differences in prevalence rates among women in different enlisted grades, but heat exhaustion and menstrual problems were more frequent in women in lower than higher grades. Enlisted women had significantly higher prevalence rates than women officers for dizziness, chills, cough, fever, constipation, back problems, migraines, and menstrual conditions. Black women reported psychological/personal problems more frequently than white women, and white women reported sore throats, strains and sprains, sinusitis, migraines, and other headaches more frequently than black women.

INTRODUCTION

Literature Review: There are numerous reports indicating that women use medical care and seek help from health care providers more often than men [1-4]. Women have also been found to report more symptomatology and higher morbidity than men [3-8]. For example, 15-18% of women report migraine headaches compared to approximately 6% of men [9,10]. However, there are relatively few large, population-based comparisons of the experience of symptoms and health conditions of relatively young men and women. There are also very few studies with sample sizes large enough to describe gender differences within different racial/ethnic groups. Data from the National Health Interview Survey suggests there may be substantial variations [11].

One possible exception to the female excess of morbidity is that more men than women have reported injuries in several national samples [12, 13]. However, among intercollegiate athletes the only gender difference in injuries was a female excess among gymnasts [14], while two studies of military trainees have reported a female excess of injuries [15, 16]. Thus it appears

that given equal exposure to risk (either sports or occupational), women may experience more injuries than men.

Objectives: The present database is unique in that it will enable us to examine the prevalence of health conditions and symptoms in relatively young men and women of several ethnic/racial groups. It will also enable us to examine gender differences in the reporting of specific health conditions and symptoms as well as in the total number of conditions reported by men and women. Specifically we will be able to examine gender differences in the experience of migraines and other headaches, and gender differences in injury rates within specific job classifications. Comparisons will be made among deployed and nondeployed individuals to determine if deployment has a negative impact on health.

Hypotheses: It is expected that within each sex, the prevalence of symptoms will increase with increasing age and be higher among ethnic/racial minorities. It is also expected that women will report a greater prevalence of headaches, injuries, and other symptoms and conditions than men, and that those who are deployed will report a higher prevalence of symptoms and conditions than the nondeployed. Because individuals who have a lower pay grade may have jobs with less control, and to the extent that having less control is more stressful, it is also expected that there will be an inverse association between pay grade and the prevalence of symptoms and conditions.

METHODS

This study is part of the Women Aboard Navy Ships Comprehensive Health and Readiness Research Project conducted at the Naval Research Center in San Diego, California as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. This epidemiologic research project utilizes several data collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important characteristics. The study has a longitudinal design with women and men enrolled in Year 1 of the study being contacted again and re-surveyed on a 12-month cycle in Year 2. All women reporting aboard ship (and matched men) in Year 2 also will be enrolled. This is a report of Year 1 survey results based on 9 months of data collected.

Population: All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1. An equal number of men serving aboard ship matched on relevant characteristics were also eligible. The Navy Bureau of Personnel (PERS-OOW) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were determined to be eligible for inclusion in the study.

This report is based on the first 22 ships surveyed. These ships were surveyed based on

availability as determined by the Commanding Officer and Medical Department of each ship. The ships included the U.S.S.: Barry, Camden, Cape Cod, Comstock, Coronado, Curtis Wilbur, Dixon, Emory S. Land, Grapple, Grasp, Holland, Kiska, L.Y. Spear, Monogahela, Mount Baker, Mount Hood, Platte, Rainier, Santa Barbara, Shenandoah, Supply, and Yellowstone (Table 1). These 22 ships had 3,813 women and 11,985 men assigned aboard.

Matching: The men aboard ship included in this study were matched to women on the following characteristics: ship, work division, department, race (white, black, Hispanic, and other), pay grade (E1-E3, E4-E6, E7-E9, O1-O3, O4-O6), rating (if no individual was available in the same rating, an individual with a closely related rating was selected), and date of birth (nearest date of birth, not to exceed plus or minus two years). In the infrequent instances where these criteria could not be met, men that matched as closely as possible to women were selected.

The procedure for selection of the matched men in the study was accomplished as follows: 1) the eligible population was determined using NHRC files, and an electronic roster was developed which included all data elements needed for matching; 2) the personnel department of each ship provided an electronic roster with limited information which was compared to the NHRC roster, and a final roster was determined; 3) a matching program was run to select the men to be included in the survey; and 4) individual identification labels were created and affixed to survey packets.

Survey Development: Several methods were used for the development of the U.S. Navy Shipboard Health Survey used in this study, including the following: 1) review of extant questionnaires, literature, and standard scales, 2) convening of a panel of subject matter experts, 3) elicitation of major issues from knowledgeable sources, and 4) review of Navy requirements concerning the reporting of women's health and access to health care.

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities [17-18] were reviewed and adopted for use in this study. The questionnaires developed by the CDC included the National Health Interview Survey [19], the Health Interview Survey Form HIS-1 (1992) and HIS-2 (1992) [20-21], the National Ambulatory Health Care Survey for 1993, 1995, and 1996 [22), and the Youth Behavior Survey [23]. Previous questionnaires developed by the Naval Health Research Center also were reviewed, and ranged from nutrition surveys to patient care surveys. In addition, a series of scales and inventories were reviewed and selected for use. These standard scales included but were not limited to: Center for Epidemiological Studies Depression Scale (CES-D) [24], a scale which measures the current frequency of depressive symptoms, and the Quality of Life Scale [25], a four-item scale previously used in research on Navy populations.

Table 1. Percent participation by ship, U.S. Navy Women Aboard Ship Study, March 1995 - October 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

		NUMBER OF PERSONNEL ASSIGNED			PERSONNEL PARTICIPATING					
					WOMEN		MEN (matched)*		TOTAL	
NAME OF SHIP (HULL NUMBER)	SHIP TYPE	Women	Men	Total	No.	Percent	No.	Percent	No.	Percent
Ships with <100 women										
1. USS BARRY (DDG 53)	GUIDED MISSILE DESTROYER	19	319	338	18	94.7	20	105.3	38	100.0
2. USS CAMDEN (AOE 2)	FAST COMBAT SUPPORT SHIP	69	576	645	54	78.3	71	102.9	125	92.0
3. USS COMSTOCK (LSD 45)	DOCK LANDING SHIP	37	298	335	30	81.1	26	70.3	56	75.7
4. USS CORONADO (AGF 11)	COMMAND SHIP	55	549	604	28	50.9	40	72.7	68	61.8
5. USS CURTIS WILBUR (DDG 654)	GUIDED MISSILE DESTROYER	23	37	60	20	87.0	25	108.7	45	97.8
6. USS GRAPPLE (ARS 53)	SALVAGE SHIP	36	67	103	31	86.1	33	91.7	64	88.9
7. USS GRASP (ARS 51)	SALVAGE SHIP	27	187	214	24	88.9	23	85.2	47	87.0
8. USS KISKA (AE 35)	AMMUNITION SHIP	75	321	396	55	73.3	19	25.3	74	49.3
9. USS MONONGAHELA (AO 178)	OILER	97	195	292	59	60.8	58	59.8	117	60.3
10. USS MOUNT BAKER (AE 34)	AMMUNITION SHIP	72	292	364	35	48.6	44	61.1	79	54.9

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		Number of personnel assigned			Personnel participating					
					Women		Men (matched)*		Total	
Name of ship (Hull Number)	Ship Type	Women	Men	Total	No.	Percent	No.	Percent	No.	Percent
11. USS MOUNT HOOD (AE 29)	Ammunition Ship	96	329	425	63	65.6	65	67.7	128	66.7
12. USS PLATTE (AO 186)	Oiler	85	183	268	43	50.6	28	32.9	71	41.8
13. USS RAINIER (AOE 7)	Fast Combat Support Ship	74	507	581	58	78.4	51	68.9	109	74.3
14. USS SANTA BARBARA (AE 28)	Ammunition Ship	87	290	377	61	70.1	68	78.2	129	74.7
15. USS SUPPLY (AOE 6)	Fast Combat Support Ship	7	594	601	7	100.0	7	100.0	14	100.0
Subtotal		859	4,744	5,603	586	68.2	578	67.3	1,164	67.8
Median						78.3		72.7		74.7
Ships with >100 women										
16. USS CAPE COD (AD 43)	Destroyer Tender	424	1,145	1,569	218	51.4	301	71.0	519	61.2
17. USS DIXON (AS 37)	Submarine Tender	397	981	1,378	210	52.9	184	46.3	394	49.6
18. USS EMORY S. LAND (AS 39)	Submarine Tender	457	1,069	1,526	307	67.2	319	69.8	626	68.5
19. USS HOLLAND (AS 32)	Submarine Tender	360	1,021	1,381	121	33.6	118	32.8	239	33.2
20. USS L.Y. SPEAR (AS 36)	Submarine Tender	394	1,038	1,432	194	49.2	152	38.6	346	43.9

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PRELIMINARY REPORT

		NUMBER OF PERSONNEL ASSIGNED			PERSONNEL PARTICIPATING					
					WOMEN		MEN (matched)*		TOTAL	
NAME OF SHIP (HULL NUMBER)	SHIP TYPE	Women	Men	Total	No.	Percent	No.	Percent	No.	Percent
21. USS SHENANDOAH (AD 44)	DESTROYER TENDER	497	1,041	1,538	244	49.1	237	47.7	481	48.4
22. USS YELLOWSTONE (AD 41)	DESTROYER TENDER	425	946	1,371	287	67.5	252	59.3	539	63.4
Subtotal		2,954	7,241	10,195	1,581	53.5	1,563	52.9	3,144	53.2
Median						51.4		47.7		49.6
All		3,813	11,985	15,798	2,167	56.8	2,141	56.2	4,337	56.5
Median						67.4		69.4		65.1

*One to one match, with two men eligible for each woman; percent greater than 100.0 indicates more men participating than originally selected

**Total number of participants includes 29 not identified by ship

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Survey Administration: The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign informed consent and to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all study subjects to remain in one area, surveys were distributed, and the participants were allowed to fill them out in work spaces. The completed surveys were collected by study staff in sealed envelopes in all cases.

Response Rates: The overall median ship response rate for the 22 ships was 65.1%, and the overall mean response rate was 56.5%. The overall median response rate for women was 67.4%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had an overall median response rate of 74.7% compared to ships with more than 100 women assigned, which had an overall median response rate of 49.6%.

Variables: Independent variables and covariates included gender, age, race/ethnicity, and pay grade. Too few women were deployed to permit comparisons. Dependent variables included health conditions or symptoms experienced in the past 30 days: common cold symptoms; dizziness; chills; cough; sore throat; fever; flu; diarrhea lasting at least 3 days; constipation; nausea/vomiting; injuries (muscle sprain or strain, back problems); hearing problems; irritated eyes; sinus trouble; heat stress or heat stroke; headache (migraine, nonmigraine); and psychological conditions or personal problems severe enough to interfere with daily activities. The Navy questionnaire includes the major components of the International Headache Society diagnostic criteria for migraines (visual disturbances, numbness or tingling, sensitivity to noise and sensitivity to light), as well as prior physician diagnosis of migraine.

Statistical analyses: Sex-specific frequencies were computed for each of the dependent variables to yield the overall prevalence of each health related condition and symptom. Stratification within each sex by age (less than 20, 20-22, 23-24, 25-29, 30-34, 35 and older) and chi square analyses and the Mantel-Haenszel extension test were used to examine the age- and sex-specific prevalence rates. Age-adjusted prevalence rates after stratification by race/ethnicity, and pay grade were also examined, using the Mantel-Haenszel extension test.

RESULTS

A total of 2,167 women and 2,141 men participated in this survey; 2,477 white, 1,352 African-American, 177 Asian/Pacific Islander, 62 Native American, 217 other and 50 unknown race. There were 2,448 enlisted personnel at levels E1-E4 and 1,616 at levels E5-E9, while 189 were officers (officers O1-O5 and warrant officers W2-W4). Only 1.2% of either men or women were deployed at the time of the survey.

The age-specific prevalence of specific symptoms experienced in the past 30 days is presented in Table 2a for men and 2b for women. For both men and women, dizziness, and

nausea/vomiting declined significantly in frequency with age, while hearing problems increased significantly with age. Among men, flu symptoms increased significantly with age. Among women, cold symptoms, coughing, psychological/personal problems, and menstrual conditions declined significantly with age. Other symptoms varied by age, but not necessarily in a linear manner.

Table 2a. Age-specific prevalence (%) of symptoms experienced in the past 30 days among men in the Navy, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE (YEARS)						
SYMPTOM	17-19 (n=142)	20-22 (n=610)	23-24 (n=306)	25-29 (n=417)	30-34 (n=351)	35+ (n=282)	p-value
Cold symptoms	43.0	46.4	41.4	46.0	45.8	40.4	0.441
Cough	37.6	36.2	32.6	33.6	36.0	29.1	0.314
Sore throat	32.1	32.7	30.1	27.1	30.9	23.6	0.087
Dizziness	14.3	15.4	10.7	11.7	8.4	11.9	0.042
Chills	10.6	14.5	7.7	10.9	9.2	9.1	0.023
Fever	11.3	14.9	11.6	14.5	16.8	16.2	0.379
Flu	2.9	7.6	6.0	10.1	9.6	9.5	0.054
Diarrhea lasting 3+ days	5.7	6.8	8.3	6.9	7.7	8.7	0.831
Constipation	2.2	4.4	6.0	5.7	7.1	8.0	0.104
Nausea/vomiting	8.6	8.0	6.4	9.7	4.8	4.0	0.031
Strains/sprains	22.7	16.4	17.8	19.3	20.3	28.1	0.003
Back problems	27.7	24.5	23.6	21.7	26.8	25.5	0.569
Heat stroke	3.6	2.4	1.3	2.7	1.8	1.1	0.447
Hearing problems	10.7	8.8	9.7	9.6	13.8	17.0	0.005
Irritated eyes	19.3	16.9	14.6	17.8	21.0	15.2	0.297
Sinus trouble	27.5	32.3	23.5	28.3	29.1	26.3	0.119

	AGE (YEARS)						
SYMPTOM	17-19 (n=142)	20-22 (n=610)	23-24 (n=306)	25-29 (n=417)	30-34 (n=351)	35+ (n=282)	p-value
Headache	46.0	51.1	47.0	49.0	56.1	53.3	0.151
Migraine	13.7	10.9	8.0	10.4	7.6	8.7	0.238
Psychological/personal problems interferring with daily activities	13.7	9.5	7.0	8.8	6.7	5.4	0.078

p-value based on chi-square statistic

Table 2b. Age-specific prevalence (%) of symptoms experienced in the past 30 days among women in the Navy, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE (YEARS)						
Symptom	17-19 (n=199)	20-22 (n=578)	23-24 (n=319)	25-29 (n=460)	30-34 (n=342)	35+ (n=245)	p-value
Cold symptoms	60.3	59.1	55.9	54.7	42.2	42.6	0.000
Cough	46.4	45.6	41.1	40.7	34.5	36.4	0.011
Sore throat	38.5	41.0	38.5	43.6	33.6	33.8	0.039
Dizziness	28.5	30.2	22.0	26.9	16.4	18.4	0.000
Chills	20.9	19.6	18.3	19.6	10.7	21.9	0.006
Fever	20.6	23.1	20.5	25.0	16.8	21.5	0.132
Flu	6.7	9.0	6.5	11.8	6.4	9.6	0.067
Diarrhea lasting 3+ days	5.7	10.9	8.2	10.3	10.1	6.9	0.189
Constipation	10.9	17.5	17.2	20.0	18.7	20.2	0.112
Nausea/vomiting	28.9	31.4	15.6	24.5	16.9	15.2	0.000
Strains/sprains	20.4	21.4	21.8	23.8	20.6	22.9	0.886
Back problems	32.1	33.5	30.0	31.6	29.1	28.1	0.629

	AGE (YEARS)						
Symptom	**17-19 (n=199)**	**20-22 (n=578)**	**23-24 (n=319)**	**25-29 (n=460)**	**30-34 (n=342)**	**35+ (n=245)**	**p-value**
Heat stroke	3.6	4.7	3.6	3.4	2.5	2.6	0.577
Hearing problems	8.8	9.1	8.8	10.6	7.0	15.2	0.037
Irritated eyes	20.1	24.4	24.8	25.9	25.4	25.2	0.747
Sinus trouble	38.3	34.4	31.3	38.2	41.0	41.1	0.067
Headache	64.8	71.5	67.0	70.6	66.7	70.8	0.344
Migraine	18.9	21.4	19.2	21.9	17.1	21.8	0.540
Psychological/personal problems interferring with daily activities	16.0	15.2	12.5	9.4	8.3	5.9	0.0004
Menstrual conditions	53.3	58.6	55.5	55.5	49.0	47.4	0.029

p-value based on chi-square statistic

The age-adjusted prevalence of specific symptoms is presented in Table 3 for both men and women. Upper respiratory cold symptoms were reported very frequently (53% of the women and 45% of the men), as were sinus troubles (37% of the women and 29% of the men) and muscle and back problems (approximately 20% of both men and women). Headaches were reported by approximately 70% of the women and 50% of the men, while migraines were reported by 20% of the women and 10% of the men. There was a significant female excess for all conditions except hearing problems and muscle strains/sprains. The greatest female excess was seen for nausea/vomiting, constipation, dizziness, headaches and migraines.

Table 3. Age-adjusted prevalence of symptoms among men and women in the Navy, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE-ADJUSTED PREVALENCE (%)		Women vs Men	
Symptom	**Men**	**Women**	**OR**	**(95% CI)**
Cold symptoms	44.5	53.0	1.4	(1.24-1.59)***

	AGE-ADJUSTED PREVALENCE (%)		Women vs Men	
Symptom	**Men**	**Women**	**OR**	**(95% CI)**
Cough	34.3	41.1	1.3	(1.17-1.51)***
Sore throat	29.7	38.9	1.5	(1.32-1.72)***
Dizziness	12.3	24.5	2.3	(1.97-2.76)***
Chills	10.9	18.4	1.8	(1.53-2.20)***
Fever	14.5	21.7	1.6	(1.38-1.92)***
Flu	8.0	8.7	1.1	(0.87-1.36)
Diarrhea	7.3	9.4	1.3	(1.04-1.63)*
Constipation	5.6	17.9	3.7	(2.96-4.61)***
Nausea/vomiting	7.1	23.1	4.0	(3.25-4.85)***
Strains/sprains	19.8	21.9	1.1	(0.98-1.33)
Back problems	24.5	21.1	1.4	(1.21-1.59)***
Heat stroke	2.2	3.6	1.7	(1.15-2.49)**
Hearing problems	11.1	9.8	0.9	(0.70-1.06)
Irritated eyes	17.4	24.7	1.6	(1.34-1.82)***
Sinus trouble	28.5	36.9	1.5	(1.29-1.67)***
Headache	50.8	69.2	2.2	(1.92-2.48)***
Migraine	9.8	20.4	2.4	(1.97-2.83)***
Psychological/personal problems	8.4	11.4	1.4	(1.14-1.77)**

OR=odds ratio, CI=confidence interval

*p<0.05, **p<0.01, ***p<0.001 based on chi-square statistic

Table 4 presents the gender-specific distribution of age by race, and pay grade. Black men and women in the Navy were significantly younger than whites, while enlisted men and women at lower levels were significantly younger than other enlisted personnel and officers. Given these significant associations with age, the age-adjusted prevalence of each condition was calculated by race, pay grade and gender.

Table 4. Distribution of age among men and women in the Navy by race and pay grade, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN		WOMEN	
		Age (years)		Age (years)
VARIABLE	NUMBER	MEAN ± SD	NUMBER	MEAN ± SD
Race				
White	1,245	26.8 ± 6.5	1,197	26.4 ± 6.4
Black	619	25.8 ± 5.9*	703	25.4 ± 5.2*
Other	231	26.8 ± 6.6	218	26.0 ± 6.5
Pay Grade				
Enlisted, E1-E4	1,117	22.3 ± 2.9	1,287	22.6 ± 3.4
Enlisted, E5-E9	861	31.7 ± 5.6*	721	31.8 ± 5.3*
Officer	91	29.6 ± 5.6*	98	28.6 ± 5.0*

*$p < 0.05$ compared to white or E1-E4

After age-adjustment, black men reported experiencing several symptoms significantly less frequently during the past 30 days than white men; cold symptoms, diarrhea, hearing problems, irritated eyes, sinus trouble, headaches, migraines, and psychological/personal problems (Table 5a). Similarly, black women reported several symptoms less frequently than white women; sore throat, strains/sprains, sinus trouble, headaches and migraines (Table 5b). However black women reported psychological/personal problems significantly more frequently. Men of other races reported a few symptoms significantly more frequently than white men; dizziness, flu symptoms and hearing problems; while women of other races reported sinus trouble, headaches and migraines significantly less frequently than white women.

Table 5a. Age-adjusted prevalence of symptoms among men in the Navy by race, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE-ADJUSTED PREVALENCE (%)			BLACK VS. WHITE		OTHER VS WHITE	
Symptom	**White**	**Black**	**Other**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Cold symptoms	45.2	40.2	45.1	0.8	(0.66-0.99)*	1.0	(0.75-1.32)
Cough	35.7	31.5	36.0	0.8	(0.66-1.01)	1.0	(0.74-1.35)
Sore throat	30.6	26.8	31.3	0.8	(0.65-1.01)	1.0	(0.75-1.41)
Dizziness	10.1	13.0	19.4	1.3	(0.97-1.81)	2.21	(1.45-3.21)***
Chills	10.5	10.9	9.5	1.0	(0.76-1.43)	0.8	(0.53-1.27)
Fever	14.9	14.8	15.2	1.0	(0.73-1.29)	1.0	(0.65-1.52)
Flu	8.1	6.9	12.8	0.8	(0.52-1.22)	1.7	(1.06-2.64)*
Diarrhea	8.0	5.2	8.3	0.6	(0.36-1.03)*	1.1	(0.58-1.97)
Constipation	5.9	5.8	5.9	0.9	(0.59-1.49)	1.0	(0.46-2.07)
Nausea/vomiting	7.5	7.1	7.1	0.9	(0.61-1.41)	0.8	(0.42-1.36)
Strains/sprains	20.6	26.7	21.4	1.2	(0.86-1.54)	1.0	(0.70-1.53)
Back problems	24.7	23.7	25.7	1.0	(0.75-1.19)	1.0	(0.76-1.47)
Heat stroke	2.4	1.6	2.2	0.7	(0.31-1.43)	0.9	(0.29-2.81)
Hearing problems	12.1	6.6	19.6	0.5	(0.35-0.74)***	1.8	(1.19-2.61)**
Irritated eyes	18.6	14.4	17.9	0.8	(0.57-0.98)*	0.9	(0.61-1.36)
Sinus trouble	31.2	23.1	27.9	0.7	(0.53-0.83)***	0.9	(0.62-1.18)
Headache	52.9	48.1	48.2	0.8	(0.67-0.99)*	0.8	(0.63-1.12)
Migraine	11.2	7.1	9.2	0.6	(0.42-0.87)**	0.8	(0.49-1.34)
Psychological/ personal problems	9.8	5.2	7.6	0.5	(0.32-0.80)**	0.8	(0.35-1.61)

OR=odds ratio, CI=confidence interval

*p<0.05, **p<0.01, ***p<0.001 based on chi-square statistic

Table 5b. Age-adjusted prevalence of symptoms among women in the Navy by race, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE-ADJUSTED PREVALENCE (%)			BLACK VS. WHITE		OTHER VS WHITE	
Symptom	**White**	**Black**	**Other**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Cold symptoms	55.3	50.8	49.5	0.8	(0.69-1.02)	0.8	(0.56-1.03)
Cough	41.7	39.3	44.0	0.9	(0.74-1.12)	1.1	(0.78-1.44)
Sore throat	41.2	35.7	38.3	0.8	(0.65-0.97)*	0.9	(0.62-1.17)
Dizziness	22.7	26.8	28.6	1.3	(0.99-1.56)	1.3	(0.94-1.87)
Chills	17.8	18.5	20.4	1.0	(0.80-1.38)	1.1	(0.75-1.67)
Fever	22.8	20.1	22.1	0.9	(0.67-1.08)	0.9	(0.62-1.35)
Flu	10.3	7.4	10.7	0.7	(0.48-1.05)	1.0	(0.56-1.76)
Diarrhea	15.8	8.1	9.9	0.8	(0.55-1.15)	1.0	(0.51-1.88)
Constipation	17.8	19.5	16.2	1.2	(0.96-1.60)	0.9	(0.54-1.58)
Nausea/vomiting	23.6	22.0	23.8	0.9	(0.73-1.18)	1.0	(0.68-1.42)
Strains/sprains	24.0	15.5	21.0	0.6	(0.37-0.85)***	0.9	(0.59-1.23)
Back problems	30.1	31.4	31.5	1.1	(0.87-1.34)	1.0	(0.75-1.45)
Heat stroke	4.0	2.4	4.8	0.6	(0.31-1.23)	1.2	(0.57-2.55)
Hearing problems	9.6	8.4	12.8	0.9	(0.62-1.26)	1.4	(0.85-2.26)
Irritated eyes	23.7	26.3	23.7	1.2	(0.94-1.47)	1.0	(0.71-1.45)
Sinus trouble	41.0	31.5	28.3	0.7	(0.54-0.81)***	0.5	(0.38-0.76)***
Headache	73.4	64.7	63.4	0.7	(0.54-0.81)***	0.6	(0.44-0.83)**
Migraine	24.8	14.4	18.1	0.5	(0.39-0.65)***	0.7	(0.44-0.96)*
Psychological/ personal problems	10.5	13.7	8.1	1.4	(1.00-1.91)*	0.8	(0.41-1.39)

	AGE-ADJUSTED PREVALENCE (%)			BLACK VS. WHITE	OTHER VS WHITE
Symptom	**White**	**Black**	**Other**	**OR (95% CI)**	**OR (95% CI)**
Menstrual conditions	53.7	55.8	52.4	1.1 (0.90-1.34)	1.0 (0.69-1.29)

OR=odds ratio, CI=confidence interval
*p<0.05, **p<0.01, ***p<0.001 based on chi-square statistic

Among men, there were very few significant differences in the age-adjusted prevalence of conditions by pay grade (Table 6a). Only heat stroke was reported significantly less often among enlisted men at higher levels (E5-E9) compared to enlisted men at more junior levels (E1-E4), and headaches were reported significantly less often among officers than enlisted men (E1-E4). Among women, there were also very few significant differences in the age-adjusted prevalence of conditions between enlisted personnel at lower and higher levels (Table 6b). Heat stroke and menstrual conditions were reported less frequently by women at higher levels (E5-E9 versus E1-E4). Female officers, however, reported several conditions significantly less frequently than enlisted women; dizziness, chills, cough, fever, constipation, back problems, migraines and menstrual conditions.

Table 6a. Age-adjusted prevalence of symptoms among men in the Navy by pay grade, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE-ADJUSTED PREVALENCE (%)			E5-E9 VS E1-E4	OFFICER VS E1-E4
Symptom	**E1-E4**	**E5-E9**	**Officer**	**OR (95% CI)**	**OR (95% CI)**
Cold symptoms	49.3	43.5	58.1	0.8 (0.63-1.12)	0.7 (0.38-1.12)
Cough	36.9	41.9	49.4	0.9 (0.65-1.19)	0.6 (0.30-1.04)
Sore throat	35.0	29.9	48.5	0.8 (0.57-1.06)	0.7 (0.35-1.19)
Dizziness	14.3	13.0	20.7	0.8 (0.53-1.26)	0.5 (0.14-1.53)
Chills	12.4	12.6	--	1.1 (0.68-1.69)	---
Fever	15.6	14.7	9.9	0.9 (0.59-1.31)	0.6 (0.25-1.30)
Flu	11.5	8.6	5.3	0.9 (0.54-1.37)	0.4 (0.13-1.15)
Diarrhea	6.9	13.3	--	0.8 (0.45-1.47)	---
Constipation	4.4	8.6	--	1.2 (0.65-2.30)	---
Nausea/vomiting	6.8	6.9	--	1.1 (0.65-1.91)	---

	AGE-ADJUSTED PREVALENCE (%)			E5-E9 VS E1-E4	OFFICER VS E1-E4
Symptom	**E1-E4**	**E5-E9**	**Officer**	**OR (95% CI)**	**OR (95% CI)**
Cold symptoms	49.3	43.5	58.1	0.8 (0.63-1.12)	0.7 (0.38-1.12)
Strains/sprains	22.1	19.8	15.0	0.9 (0.63-1.32)	0.7 (0.30-1.40)
Back problems	23.1	22.7	13.6	0.9 (0.64-1.28)	0.6 (0.29-1.28)
Heat stroke	4.5	1.4	--	0.4 (0.15-0.90)*	---
Hearing problems	13.8	11.3	7.5	0.7 (0.43-1.07)	0.6 (0.24-1.34)
Irritated eyes	17.9	15.7	12.7	0.8 (0.51-1.08)	0.8 (0.35-1.99)
Sinus trouble	29.6	30.0	30.2	0.9 (0.65-1.23)	0.6 (0.27-1.40)
Headache	52.1	58.9	38.0	1.2 (0.88-1.60)	0.4 (0.25-0.78)**
Migraine	10.2	7.1	--	0.8 (0.44-1.31)	---
Psychological/ personal problems	8.1	7.0	--	0.6 (0.33-1.05)	---

E=enlisted, OR=odds ratio, CI=confidence interval
*p<0.05, **p<0.01 based on chi-square statistic

Table 6b. Age-adjusted prevalence of symptoms among women in the Navy by pay grade, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE-ADJUSTED PREVALENCE (%)			E5-E9 VS E1-E4	OFFICER VS E1-E4
Symptom	**E1-E4**	**E5-E9**	**Officer**	**OR (95% CI)**	**OR (95% CI)**
Cold symptoms	57.4	53.0	47.4	0.9 (0.68-1.19)	0.7 (0.44-1.15)
Cough	39.2	41.0	23.4	1.0 (0.76-1.34)	0.4 (0.25-0.77)**
Sore throat	38.4	34.2	32.2	0.9 (0.65-1.17)	0.7 (0.43-1.16)
Dizziness	25.8	27.4	16.0	0.8 (0.57-1.10)	0.4 (0.18-0.87)**
Chills	18.5	14.9	13.3	0.9 (0.60-1.24)	0.4 (0.15-0.87)*
Fever	24.5	25.7	15.8	0.9 (0.61-1.20)	0.5 (0.27-0.99)*
Flu	9.1	10.1	9.5	0.8 (0.52-1.34)	0.8 (0.23-2.88)

	AGE-ADJUSTED PREVALENCE (%)			E5-E9 VS E1-E4	OFFICER VS E1-E4
Symptom	**E1-E4**	**E5-E9**	**Officer**	**OR (95% CI)**	**OR (95% CI)**
Diarrhea	11.5	8.7	---	0.7 (0.41-1.06)	---
Constipation	18.6	16.1	10.3	0.8 (0.56-1.14)	0.5 (0.20-1.00)*
Nausea/vomiting	25.5	25.0	29.9	0.7 (0.52-1.06)	0.9 (0.46-1.56)
Strains/sprains	20.6	18.4	22.9	1.0 (0.72-1.54)	1.0 (0.51-1.83)
Back problems	32.5	27.9	18.8	0.8 (0.59-1.10)	0.5 (0.30-0.97)*
Heat stroke	5.1	4.8	---	0.3 (0.08-1.06)***	---
Hearing problems	12.3	7.8	4.9	0.7 (0.42-1.07)	0.4 (0.15-1.05)
Irritated eyes	27.4	26.2	21.3	0.8 (0.55-1.05)	0.7 (0.39-1.21)
Sinus trouble	37.0	37.3	31.5	0.8 (0.62-1.10)	0.8 (0.45-1.25)
Headache	62.3	67.7	62.5	1.0 (0.77-1.41)	1.1 (0.66-1.81)
Migraine	19.9	22.7	9.5	1.0 (0.71-1.40)	0.4 (0.13-1.21)*
Psychological/personal problems	15.7	11.4	---	0.8 (0.52-1.25)	---
Menstrual conditions	61.3	57.0	63.1	0.7 (0.52-0.97)*	0.6 (0.32-0.96)*

E=enlisted, OR=odds ratio, CI=confidence interval
*$p<0.05$, **$p<0.01$ based on chi-square statistic

CONCLUSIONS

Upper respiratory cold symptoms were reported very frequently (53% of the women and 45% of the men), as were sinus troubles (37% of the women and 29% of the men) and muscle and back problems (approximately 20% of both men and women). Headaches were reported by approximately 70% of the women and 50% of the men, while migraines were reported by 20% of the women and 10% of the men. There was a significant female excess for all reported conditions except hearing problems and muscle strains/sprains, while the greatest female excess was seen for nausea/vomiting, constipation, dizziness, headaches and migraines.

Black men and women in the Navy were significantly younger than whites. After age-adjustment, the prevalence of several conditions varied significantly by race among both men and women. Black men and women reported physical symptoms significantly less frequently than whites, however, black women reported psychological/personal problems significantly more frequently than white women. In addition, female officers reported several conditions significantly less frequently than enlisted women; dizziness, chills, cough, fever, constipation, back problems, migraines and menstrual conditions. There were very few significant differences, however, in the age-adjusted prevalence of conditions by pay grade among men.

Notes:

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APPENDIX G.3

Menstrual and Reproductive Health Conditions Among Women in the Navy

Donna Kritz-Silverstein, Ph.D. and Deborah L. Wingard, Ph.D.

REPORT AREA TOPIC: MENSTRUAL AND REPRODUCTIVE HEALTH CONDITIONS AMONG WOMEN IN THE NAVY

LEAD AUTHORS: Donna Kritz-Silverstein, Ph.D., and Deborah L. Wingard, Ph.D.

ABSTRACT

Self-reported menstrual and reproductive health conditions during the past 90 days and irregular menstrual periods during the past 12 months were ascertained by questionnaire from 2,167 women aboard 22 ships. Thirty-seven percent of respondents had irregular menstrual periods during the past 12 months. During the past 90 days, 25% reported heavy periods and 27% reported cramps or pain during periods severe enough to require time away from work or medication. Sixteen percent reported bleeding between periods, and 15% had periods lasting more than one week. Many (20%) reported abdominal pain from unknown causes, and some reported pain from cysts (7%) or endometriosis (4%). For each symptom reported, 5% or fewer women reported first noticing the symptom while aboard ship, but 7% reported that heavy periods worsened aboard ship. Eleven percent of women reported that they needed to take two or more hours away from work during the past 90 days due to menstrual symptoms. Prevalence rates of menstrual symptoms tended either to decline significantly with age (bleeding between periods, cramps during periods, periods lasting longer than one week, and abdominal pain of unknown cause) or to remain constant (heavy periods, abdominal pain from cysts), with the exception of irregular periods during the past 12 months, which occurred at a dramatically higher rate (71%) at 35 years and older. There were few differences in age-adjusted prevalence rates by pay grade, but serious cramps and pain during periods were less prevalent in women officers than enlisted women (OR=0.4, 95% CI 0.2-0.9). There were few differences in age-adjusted prevalence rates according to race, but abdominal pain from cysts was more prevalent in black than white women (OR=1.7, 95% CI 1.2-2.5).

INTRODUCTION

Literature Review: It has been estimated that 50-85% of the 15 million menstruating women in the United States suffer to one degree or another from dysmenorrhea and other menstrual and premenstrual symptoms [1-3]. Endometriosis is a disease of the female pelvic mesenchyme in which tissue with epithelial and stromal characteristics of the endometrium develops in a situation other than in the uterus [4]. The reported prevalence of endometriosis ranges from a low of 1-8% [5-7], to 22% among nonpregnant women and 16% among pregnant women [8, 9]. As many as 54% of all women with endometriosis report chronic pelvic pain and as many as 81% also complain of dysmenorrhea [10]. Menstrual symptoms also vary with age [2, 3, 11, 12] and race/ethnicity [12-14].

For some women, the symptoms associated with the menstrual cycle are severe enough to cause a disruption in their daily activity [2, 3]. These symptoms are responsible for more lost

work and school hours among women than any other disease entity [1-3, 15]. Approximately 5-15% of all women (almost 3.5-7 million American women) are incapacitated for one to two days each month because of their symptoms [1, 16, 17]. Thus, the experience of menstrual and reproductive system disorders may create an economic burden for employers as well as for the women themselves. However, there have been relatively few large, population-based studies of the prevalence of menstrual and reproductive system disorders, and the time lost from work due to dysmenorrhea or other symptoms.

Objectives: The present study is designed to overcome the lack of scope in previous studies. It will describe the prevalence of disorders associated with the menstrual cycle and reproductive system, and it will also describe the prevalence of time lost from work due to these disorders among women in the Navy. Ovulatory and menstrual disturbances have been associated with stress [18, 19]. One could argue, that deployed women experience more stress than nondeployed since their usual schedules may be disrupted, they are separated from family for extended periods, and because they are confined to living within the relatively close quarters of a ship. For the Navy, loss of time from work may be even more problematical to the extent that it occurs among deployed women. Aboard ship, there may be fewer individuals trained for each specific job, thus an woman's absence would create an increased burden on her fellow coworkers. Therefore, this study will also compare the prevalence menstrual related disorders and time lost from work by deployment status (deployed/not deployed), and by pay grade.

Hypotheses: It is expected that the prevalence of symptoms may increase with increasing age and be higher among ethnic/racial minorities. Because women who have a lower pay grades may have a different shipboard experience with regard to occupational exposures, job responsibilities, living conditions and many other factors, it is expected that there may be an inverse association of pay grade with the prevalence and incidence of symptoms, and the prevalence rate of time lost from work due to these symptoms.

METHODS

This study is part of the Women Aboard Navy Ships Comprehensive Health and Readiness Research Project conducted at the Naval Research Center in San Diego, California as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. This epidemiologic research project utilizes several data collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important characteristics. The study has a longitudinal design with women and men enrolled in Year 1 of the study being contacted again and re-surveyed on a 12-month cycle in Year 2. All women reporting aboard ship (and matched men) in Year 2 also will be enrolled. This is a report of Year 1 survey results based on 9 months of data collected.

Population: All women serving aboard U.S. Navy ships were eligible for inclusion in the

survey portion of the study during Year 1. An equal number of men serving aboard ship matched on relevant characteristics were also eligible. The Navy Bureau of Personnel (PERS-OOW) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were determined to be eligible for inclusion in the study.

This report is based on the first 22 ships surveyed. These ships were surveyed based on availability as determined by the Commanding Officer and Medical Department of each ship. The ships included the USS: BARRY, CAMDEN, CAPE COD, COMSTOCK, CORONADO, CURTIS WILBUR, DIXON, EMORY S. LAND, GRAPPLE, GRASP, HOLLAND, KISKA, L.Y. SPEAR, MONONGAHELA, MOUNT BAKER, MOUNT HOOD, PLATTE, RAINIER, SANTA BARBARA, SHENANDOAH, SUPPLY, and YELLOWSTONE (Table 1). These 22 ships had 3,813 women and 11,985 men assigned aboard.

Survey Development: Several methods were used for the development of the U.S. Navy Shipboard Health Survey used in this study, including the following: 1) review of extant questionnaires, literature, and standard scales, 2) convening of a panel of subject matter experts, 3) elicitation of major issues from knowledgeable sources, and 4) review of Navy requirements concerning the reporting of women's health and access to health care.

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities [20-21] were reviewed and adopted for use in this study. The questionnaires developed by the CDC included the National Health Interview Survey [22] the Health Interview Survey Form HIS-1 (1992) and HIS-2 (1992) [23-24], the National Ambulatory Health Care Survey for 1993, 1995, and 1996 [25], and the Youth Behavior Survey [26]. Previous questionnaires developed by the Naval Health Research Center also were reviewed, and ranged from nutrition surveys to patient care surveys. In addition, a series of scales and inventories were reviewed and selected for use. These standard scales included but were not limited to: Center for Epidemiological Studies Depression Scale (CES-D) [27], a scale which measures the current frequency of depressive symptoms, and the Quality of Life Scale [28], a four-item scale previously used in research on Navy populations.

Survey Administration: The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign informed consent and to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all study subjects to remain in one area, surveys were distributed, and the participants were allowed to fill them out in work spaces. The completed surveys were collected by study staff in sealed envelopes in all cases.

Table 1. Percent participation by ship, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

		NUMBER OF PERSONNEL ASSIGNED			PERSONNEL PARTICIPATING					
					WOMEN		MEN (matched)*		TOTAL	
NAME OF SHIP (HULL NUMBER)	SHIP TYPE	Women	Men	Total	No.	Percent	No.	Percent	No.	Percent
Ships with <100 women										
1. USS BARRY (DDG 53)	GUIDED MISSILE DESTROYER	19	319	338	18	94.7	20	105.3	38	100.0
2. USS CAMDEN (AOE 2)	FAST COMBAT SUPPORT SHIP	69	576	645	54	78.3	71	102.9	125	92.0
3. USS COMSTOCK (LSD 45)	DOCK LANDING SHIP	37	298	335	30	81.1	26	70.3	56	75.7
4. USS CORONADO (AGF 11)	COMMAND SHIP	55	549	604	28	50.9	40	72.7	68	61.8
5. USS CURTIS WILBUR (DDG 654)	GUIDED MISSILE DESTROYER	23	37	60	20	87.0	25	108.7	45	97.8
6. USS GRAPPLE (ARS 53)	SALVAGE SHIP	36	67	103	31	86.1	33	91.7	64	88.9
7. USS GRASP (ARS 51)	SALVAGE SHIP	27	187	214	24	88.9	23	85.2	47	87.0
8. USS KISKA (AE 35)	AMMUNITION SHIP	75	321	396	55	73.3	19	25.3	74	49.3
9. USS MONONGAHELA (AO 178)	OILER	97	195	292	59	60.8	58	59.8	117	60.3
10. USS MOUNT BAKER (AE 34)	AMMUNITION SHIP	72	292	364	35	48.6	44	61.1	79	54.9
11. USS MOUNT HOOD	AMMUNITION SHIP	96	329	425	63	65.6	65	67.7	128	66.7

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		Number of personnel assigned			Personnel participating					
					Women		Men (matched)*		Total	
Name of ship (Hull Number)	Ship Type	Women	Men	Total	No.	Percent	No.	Percent	No.	Percent
12. USS PLATTE (AO 186)	Oiler	85	183	268	43	50.6	28	32.9	71	41.8
13. USS RAINIER (AOE 7)	Fast Combat Support Ship	74	507	581	58	78.4	51	68.9	109	74.3
14. USS SANTA BARBARA (AE 28)	Ammunition Ship	87	290	377	61	70.1	68	78.2	129	74.7
15. USS SUPPLY (AOE 6)	Fast Combat Support Ship	7	594	601	7	100.0	7	100.0	14	100.0
Subtotal		859	4,744	5,603	586	68.2	578	67.3	1,164	67.8
Median						78.3		72.7		74.7
Ships with >100 women										
16. USS CAPE COD (AD 43)	Destroyer Tender	424	1,145	1,569	218	51.4	301	71.0	519	61.2
17. USS DIXON (AS 37)	Submarine Tender	397	981	1,378	210	52.9	184	46.3	394	49.6
18. USS EMORY S. LAND (AS 39)	Submarine Tender	457	1,069	1,526	307	67.2	319	69.8	626	68.5
19. USS HOLLAND (AS 32)	Submarine Tender	360	1,021	1,381	121	33.6	118	32.8	239	33.2
20. USS L.Y. SPEAR (AS 36)	Submarine Tender	394	1,038	1,432	194	49.2	152	38.6	346	43.9
21. USS SHENANDOAH (AD 44)	Destroyer Tender	497	1,041	1,538	244	49.1	237	47.7	481	48.4

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		NUMBER OF PERSONNEL ASSIGNED			PERSONNEL PARTICIPATING					
					WOMEN		MEN (matched)*		TOTAL	
NAME OF SHIP (HULL NUMBER)	SHIP TYPE	Women	Men	Total	No.	Percent	No.	Percent	No.	Percent
22. USS YELLOWSTONE (AD 41)	DESTROYER TENDER	425	946	1,371	287	67.5	252	59.3	539	63.4
Subtotal		2,954	7,241	10,195	1,581	53.5	1,563	52.9	3,144	53.2
Median						51.4		47.7		49.6
All		3,813	11,985	15,798	2,167	56.8	2,141	56.2	4,337	56.5
Median						67.4		69.4		65.1

*One to one match, with two men eligible for each woman; percent greater than 100.0 indicates more men participating than originally selected.

**Total number of participants includes 29 not identified by ship

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Response Rates: The overall median ship response rate for the 22 ships was 65.1%, and the overall mean response rate was 56.5%. The overall median response rate for women was 67.4%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had an overall median response rate of 74.7% compared to ships with more than 100 women assigned, which had an overall median response rate of 49.6%.

Variables: Independent variables and covariates included age, race/ethnicity, and pay grade. Too few women were deployed (≈1%) to permit comparisons. Dependent variables included bleeding between periods; excessive frequency of periods (time between periods too short); cramps or pain during the menstrual period requiring medication or time off work; heavy periods (excessive menstrual flow); period lasting longer than one week; scanty menstrual flow; irregular periods; other symptoms related to menstrual periods; abdominal pain from endometriosis; abdominal pain from known cysts; abdominal pain from other or unknown causes; breast disorders (lumps, discharge); missing 2 or more hours from work during the previous 90 days due to symptoms or disorders of the reproductive system; and missing 1 or more days of work during the previous 90 days due to symptoms or disorders of the reproductive system.

Statistical analyses: Frequencies were computed for each of the dependent variables to yield the overall prevalence of symptoms and time missed from work. Stratification by age (less than 20, 20-22, 23-24, 25-29, 30-34, 35 and older) and chi square analyses were used to examine the age-specific prevalence rates. Age-adjusted prevalence rates after stratification by race/ethnicity and pay grade were also examined using the Mantel-Haenszel extension test.

RESULTS

A total of 2,167 Navy women participated in this survey; 1,209 White, 711 African-American, 83 Asian/Pacific Islander, 32 Native American, 105 other and 27 unknown race. There were 1,287 enlisted women at levels E1-E4 and 721 women at levels E5-E9, while 98 women were officers (officers 1-5 and warrant officers 2-4). Only 1.2% of the women were deployed at the time of the survey.

Table 2 presents the proportion of women in the Navy reporting various menstrual and reproductive conditions in the past 90 days, as well as the percent first noticing these symptoms while aboard ship, and the percent reporting a worsening of symptoms while aboard ship. Approximately 37% of the women reported having irregular periods in the past 12 months, while 25% reported heavy periods during the past 90 days and cramps or pain during periods that required medication or time off. Nearly 16% reported bleeding between periods and 15% periods lasting more than a week. While only 7% reported abdominal pain from cysts and 4% from endometriosis, approximately 20% reported abdominal pain from unknown causes. Breast lumps were reported by 5% of the women, and breast discharge by 4%.

Table 2. Proportion of women in the Navy experiencing various menstrual and reproductive conditions, 1995 (n=2,143), U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996

SYMPTOM	NUMBER	% EXPERIENCED IN PAST 90 DAYS	% FIRST NOTICED ABOARD SHIP	% WORSENED ABOARD
Irregular periods past 12 months	2,053	37.1	--	--
Bleeding between periods	1,946	15.7	5.2	3.7
Cramps/pain during period requiring medication or time off	1,953	26.7	1.0	1.9
Excessive frequency of periods	1,926	11.5	3.6	3.4
Heavy periods	1,929	24.7	5.2	6.9
Period lasting >1 week	1,952	14.8	3.9	3.8
Scanty menstrual flow	1,871	12.3	2.9	2.7
Abdominal pain (cysts)	1,890	7.4	1.3	2.1
Abdominal pain (endometriosis)	1,860	3.8	0.7	1.2
Abdominal pain (unknown cause)	1,878	20.1	4.2	5.0
Breast discharge	1,949	4.4	1.2	0.6
Breast lump	1,939	5.3	2.1	0.6
Missed <2 hours off work due to symptoms	2,022	11.3	--	--
Missed <1 day work due to symptoms	2,008	6.9	--	--

The 94 women reporting regular periods, but not one per month are classified as having regular periods

Note: 18.7% of 2,056 women reported using birth control pills to regulate their period. 1.7% of 2,058 women reported using estrogen replacement pills in past 90 days and 0.6% using estrogen creams.

Age (years) mean =26; median =24; mode =20; range=18-49

For each of the symptoms, 5% or less reported first noticing it while aboard ship. However, 7% reported that heavy periods worsened when aboard ship, and 4% that bleeding between periods and long periods worsened when aboard ship. Over 11% of women reported needing to take two or more hours and 7% one or more days off work due to the menstrual and other symptoms.

The age-specific prevalence of each condition is presented in Table 3. Many of the menstrual symptoms declined significantly with age, with the exception of irregular periods which increased dramatically after age 35. Frequency of breast lumps also increased significantly with age.

Table 3. Age-specific prevalence of symptoms (per 100) among women in the Navy, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996

	AGE (YEARS)						
SYMPTOM	**17-19 (n=199)**	**20-22 (n=578)**	**23-24 (n=319)**	**25-29 (n=460**	**30-34 (n=342)**	**35+ (n=245)**	**p-value**
Irregular periods in past 12 months	40.3	45.6	41.7	33.7	27.2	70.8	0.0000
Bleeding between periods	14.1	19.0	19.3	16.7	12.0	9.3	0.003
Cramps/pain during period	35.4	31.1	21.1	27.7	22.3	20.8	0.000
Excessive frequency of periods	12.2	14.6	13.7	9.3	7.9	10.6	0.032
Heavy periods	26.2	26.7	23.6	25.6	20.1	25.0	0.398
Period lasting greater than 1 week	17.9	19.1	16.0	13.3	10.1	9.3	0.001
Scanty menstrual flow	13.5	14.1	8.9	15.3	9.3	9.9	0.042
Abdominal pain (cysts)	7.5	7.8	7.1	8.1	6.4	7.8	0.971
Abdominal pain (endometriosis)	3.6	4.1	3.2	3.8	5.1	2.3	0.674
Abdominal pain (unknown cause)	23.2	22.2	20.9	22.1	16.0	13.6	0.028
Breast discharge	4.0	3.7	5.2	6.0	2.9	3.1	0.261
Breast lump	3.4	4.7	3.5	4.9	6.8	9.3	0.033
Missed 2 or more hours of work due to symptoms	12.8	12.7	12.5	12.1	8.4	8.3	0.223
Missed 1 or more days of work due to symptoms	5.3	8.2	8.9	7.9	4.4	4.0	0.054

p-value based on chi-square statistic

Table 4 presents the distribution of age by race and pay grade. Black women in the Navy were significantly younger than white women. Given these significant associations with age, the age-adjusted prevalence of each condition was calculated by race and pay grade.

Table 4. Distribution of age among women in the Navy by race and pay grade, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

		AGE (YEARS)	
VARIABLE	NUMBER	MEAN ± SD	RANGE
Race			
White	1197	26.4 ± 6.4	18 - 48

Black	703	25.4 ± 5.2*	18 - 44
Other	218	26.0 ± 6.5	18 - 49
Pay Grade			
Enlisted, E1 - E4	1287	22.6 ± 3.4	18 - 39
Enlisted, E5 - E9	721	31.8 ± 5.3*	20 - 49
Officer	98	28.6 ± 5.0*	22 - 42

*$p < 0.05$ compared to white or E1 - E4

As shown in Table 5, very few conditions exhibited differences in age-adjusted prevalence by race. Abdominal pain from cysts and breast discharge were higher among black women and women of other races compared to white women, but this difference was significant only for abdominal pain among black women.

Table 5. Age-adjusted prevalence of symptoms among women in the Navy by race, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

SYMPTOM	WHITE	BLACK	OTHER	OR (95% CI)	OR (95% CI)
Irregular periods in past 12 months	38.3	39.3	40.9	1.0 (0.77-1.17)	0.9 (0.67-1.23)
Bleeding between periods	14.2	17.5	18.3	1.3 (0.95-1.72)	1.4 (0.88-2.05)
Cramps/pain during period	25.0	28.5	29.4	1.2 (0.96-1.51)	1.1 (0.88-1.78)
Excessive frequency of periods	12.2	10.0	13.7	0.8 (0.57-1.13)	1.1 (0.69-1.89)
Heavy periods	24.0	25.7	24.4	1.1 (0.87-1.38)	1.0 (0.71-1.47)
Period lasting more than 1 week	14.2	15.4	15.9	1.1 (0.81-1.46)	1.1 (0.73-1.75)
Scanty menstrual flow	13.6	10.8	10.1	0.8 (0.55-1.13)	0.7 (0.36-1.26)
Abdominal pain (cysts)	5.9	9.7	8.7	1.7 (1.15-2.49)**	1.6 (0.80-3.25)
Abdominal pain (endometriosis)	3.5	4.2	4.7	1.2 (0.64-2.32)	1.3 (0.53-3.29)
Abdominal pain (unknown cause)	19.7	21.2	19.7	1.1 (0.85-1.43)	1.0 (0.65-1.47)
Breast discharge	3.5	5.5	5.2	1.6 (0.94-2.72)	1.6 (0.73-3.35)
Breast lump	8.2	6.1	5.1	0.8 (0.44-1.45)	0.5 (0.16-1.86)
Missed 2 or more hours of work due to symptoms	11.0	13.7	13.6	1.4 (0.99-1.83)	1.3 (0.79-2.21)
Missed more than 1 day of work due to symptoms	7.8	7.8	8.9	1.1 (0.73-1.69)	1.2 (0.65-2.09)

OR=odds ratio, CI=confidence interval

**$p<0.01$ based on chi-square statistic

Similarly, very few conditions exhibited differences in age-adjusted prevalence by pay grade (Table 6). Cramps or pain during periods (requiring medication or time off) and irregular periods were significantly lower among officers compared to enlisted personnel (E1-E4). Breast lumps were also less frequent among officers than enlisted women, but not significantly.

Table 6. Age-adjusted prevalence of symptoms among women in the Navy by pay grade, 1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	AGE-ADJUSTED PREVALENCE (%)			E5-E9 vs E1-E4		OFFICERS vs E1-E4	
SYMPTOM	**E1-E4**	**E5-E9**	**Officer**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Irregular periods in past 12 months	33.6	46.0	29.2	1.2	(0.86-1.59)	0.4	(0.24-0.84)**
Bleeding between periods	15.6	17.7	21.6	1.1	(0.74-1.65)	1.1	(0.58-2.17)
Cramps/pain during period	23.7	30.0	20.3	0.8	(0.57-1.14)	0.4	(0.20-0.95)*
Excessive frequency of periods	11.9	10.8	16.6	1.0	(0.62-1.63)	0.8	(0.31-1.85)
Heavy periods	25.4	22.8	22.0	0.8	(0.56-1.13)	0.6	(0.32-1.17)
Period lasting more than 1 week	14.7	17.1	17.3	1.2	(0.81-1.98)	0.7	(0.28-1.84)
Scanty menstrual flow	13.5	8.8	13.6	1.0	(0.60-1.74)	1.1	(0.54-2.17)
Abdominal pain (cysts)	8.9	5.5	5.1	0.6	(0.35-1.11)	0.6	(0.22-1.68)
Abdominal pain (endometriosis)	4.8	2.6	5.7	0.5	(0.23-1.14)	1.1	(0.35-3.51)
Abdominal pain (unknown cause)	20.1	15.1	20.9	0.9	(0.57-1.30)	0.7	(0.35-1.46)
Breast discharge	3.9	5.6	3.7	1.2	(0.61-2.34)	0.8	(0.26-3.27)
Breast lump	7.4	5.4	2.8	0.8	(0.45-1.31)	0.3	(0.06-1.22)
Missed more than 2 hours of work due to symptoms	11.3	12.4	11.3	1.4	(0.93-2.24)	0.4	(0.13-1.31)
Missed more than 1 day of work due to symptoms[+]	6.3	6.4	--	1.2	(0.65-2.17)	--	

E=enlisted, OR=odds ratio, CI=confidence interval
*p<0.05, **p<0.01 based on chi-square statistic
[+]No officers missed ³1 day of work due to symptoms

CONCLUSIONS

Menstrual symptoms were reported frequently by women in the Navy. In the past 12 months, 37% of the women reported experiencing irregular periods, while in the past 90 days approximately 25% reported heavy periods and cramps or pain severe enough to require medication or time off, and nearly 16% bleeding between periods. In addition, several women reported symptoms of potentially

serious conditions, i.e. breast discharge (4%) and breast lump (5%). For each symptom, 5% or less reported first noticing it while aboard ship. However, 7% reported that heavy periods worsened when aboard ship, and 4% that bleeding between periods and long periods worsened when aboard ship.

In addition to discomfort and possibly serious consequences, these menstrual and other reproductive tract symptoms affected women's ability to work. During the past 90 days over 11% of women reported needing to take two or more hours off work, and 7% one or more days off work due to menstrual and other symptoms.

Many of the menstrual symptoms declined with age, however, irregular periods and breast lumps increased with age. Black women in the Navy were significantly younger than white women. After adjustment for these age differences, very few conditions exhibited significant differences in prevalence by race or pay grade.

Notes:

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APPENDIX G.4

Health Beliefs Model in Shipboard U.S. Navy Men and Women

LT Michael James Schwerin, MSC, USNR

REPORT TOPIC AREA: THE HEALTH BELIEFS MODEL IN SHIPBOARD U.S. NAVY MEN AND WOMEN

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ABSTRACT

A matched sample of men and women in the U.S. Navy (N = 1,064) were examined in a study of shipboard health care utilization. The instrument used in this study is based on the Health Beliefs Model (HBM). The HBM attempts to explain health-seeking behavior by describing the antecedent conditions within the individual. Preliminary chi-square results indicate statistically significant gender differences in health care utilization. Multivariate Analysis of Variance (MANOVA) results indicated that women reported significantly greater ratings of health value, greater rating of perceived illness (compared to people their own age), greater perceived susceptibility to health problems, and greater perceived susceptibility to serious illness than men. Separate discriminant function analyses were employed for males and females. Results for each separate discriminant function analysis yielded a single statistically significant function for females only. Implications of these findings and the efficacy of the HBM are discussed.

INTRODUCTION

Women have been shown to utilize health care significantly more than men in both military and civilian populations. In an examination of U.S. Navy shipboard personnel and their utilization of health care, Nice and Hilton found that shipboard women utilize health care more than men and that women in nontraditional occupations visited sick call significantly more than women in traditional occupations [1]. Civilian population, controlling for pregnancy-related health care utilization and age, numerous studies have demonstrated that women utilize health care more than men [2-10].

The Health Beliefs Model [11] (HBM) has been investigated as a theory that attempts to explain health-seeking/promotion behavior by describing antecedent conditions within the individual. Initially, the willingness of the individual to seek health care is influenced by that person's perception of his or her susceptibility to, and the severity of, that particular illness or disease. The cue to action can be triggered by an individual's evaluation of his or her own health status. This evaluation of one's health status is a reflection of the risks of one's susceptibility to and severity of a particular disease. Health-seeking behavior is a condition of an individual's estimate of the potential benefits of health-seeking action to reduce susceptibility or severity. The benefits are then weighed against perceptions of physical, psychological, financial, and other risks, costs, or barriers in the health-finding effort.

The HBM was conceptualized as a framework for understanding why individuals did or did not engage in a wide variety of health-related actions [12]. Since the 1950s, the HBM has

been utilized in preventive breast self-examination [13-14], adherence to therapeutic regimens [15-21], preventive health behavior [22], smoking [23], and dietary compliance [24]. In a review of the results of 29 HBM-related investigations, Janz and Becker [12, p1] conclude that there is "substantial empirical support for the HBM."

Norman and Fitter [25] examined the role of the HBM in health screening attendance. Correlational and regression analyses show general health beliefs (health value, health comparison, and illness activities) to be poor predictors of intent to attend screenings, while significant predictors include perceptions of the efficacy of screenings, perceptions of barriers ("worries" of the screening appointment), and perceived susceptibility to common illness. Norman and Fitter [26] then sought to identify variables that would be predictive of health screening attendance. A stepwise discriminant analysis showed that patients' beliefs about the severity of high blood pressure and weight problems, "worries" about the screening appointment, and the extent to which patients reported cutting back on everyday activities when ill discriminated between screening attenders and nonattenders. Norman [27] examined the HBM and intent to attend a health screening. Of the HBM variables included in analyses, only health value was a significant predictor of attendance. Norman and Conner [28] used the HBM questionnaire as well as the Theory of Planned Behavior [29-30, TPB] to predict attendance at health screenings. HBM factors that were significantly predictive of attendance, as shown by a discriminant analysis, included health value, perceived benefits of health checks, and motivational factors.

Using HBM questionnaire items [24-25], this study examined what variables are predictive of health care utilization among men and women serving aboard ship in the U.S. Navy. This study also attempted to determine which HBM factors (health value, perceived susceptibility to disease, perceived severity of disease, potential benefits, perceptions of barriers) may influence sex differences that exist in health care utilization aboard ship.

METHOD

Participants

Participants in this study were selected from U.S. Navy personnel serving aboard ship for the study titled, "Women Aboard Navy Ships: A Comprehensive Health and Readiness Research Project" conducted at the Naval Health Research Center in San Diego, California, as part of the Defense Women's Health Research Program, administered by the U.S. Army Medical Research and Material Command, Fort Detrick, Maryland. This study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men, matched on important demographic characteristics. For the first year of this research project, data were provided from 22 ships, including 4 submarine tenders, 4 ammunition ships, 3 destroyer tenders, 3 fast combat support ships, 2 destroyers, 2 fleet oilers, 2 fleet support ships, 1 auxiliary command ship, and 1 dock landing ship.

Men were matched to women on the following characteristics: ship, work division, department, race, pay grade, rating, and date of birth (not to exceed plus or minus two years). In the infrequent instances where these criteria could not be met, men that matched as closely as possible to women were selected. The matching procedure was as follows: (1) the eligible population was determined using an electronic roster which included all data elements necessary for matching; (2) each ship corrected and verified personnel rosters; (3) a matching program was run to select men to be included in the survey; and (4) individual identification labels were created and affixed to survey packets.

Of study participants, an overall median ship response rate for the 22 ships was 65.1%, and the overall mean response rate was 56.5%. From those who received the HBM questionnaire, a sample of 610 men and 611 women were included in this study (n = 1,221). Due to incomplete and missing data, 157 subjects were excluded from subsequent analyses leaving a sample of 1,064 subjects (males = 529, females = 535).

The mean age of participants was 25.69 years for females and 25.99 years for males. For the study sample, 55.5% of subjects were Caucasian/non-Hispanic, 31.7% were African-American/non-Hispanic, 5.5% were Caucasian/Hispanic, 4.0% were Asian/Pacific Islander, 1.7% were African-American/Hispanic, and 1.6% were Native American. Of the study sample 44.3% of subjects had never been married, 43.7% were "currently married," 6.1% were divorced/not married, 5.8% were separated, and 0.1% were widowed.

Instrument

The Health Beliefs Questionnaire [24-25, HBQ] is based on the HBM (see Appendix 1). Items were selected for the HBQ from items in previous studies measuring the HBM [24,31-41]. Items that did not possess adequate item-total correlations for each subscale ($r_{I-T} < .30$) and reduced the subscale Cronback alpha to an unacceptable level (alpha $< .50$) were excluded from further analysis. These items were: "I seem to resist illness better than other people," "When I'm ill, I try to keep going on as usual," and "I already feel healthy." For the remaining items, Cronbach alpha shows subscales possess adequate internal consistency reliability.

A measure of medical-care satisfaction was constructed for this study. Five items measured quality of medical services provided, amount of privacy during exam, amount of waiting time, availability of medications, and availability of medical supplies. This composite score possessed adequate internal consistency reliability to be included in subsequent analyses. Reliabilities for the HBM questionnaire and medical-care satisfaction scale used in this study as well as other studies appear in Table 1 (see Table 1).

Table 1. Cronbach alpha for Health Beliefs Model questionnaire subscales, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

SUBSCALE NAME	A	B	C	D	E
Health Value	.82	.54	.69	.77	.80
Health Comparison	.90	.70	.75	---	---
Illness Activities	.49	.56	.64	---	---
Susceptibility to Serious Illnesses	.95	.89	.94	.91	.86*
Susceptibility to Health Problems	.60	.54	.53	---	.90*
Severity of Serious Illnesses	.98	.95	.95	.97	.86*
Severity of Health Problems	.78	.58	.82	---	.90*
Barrier: Motivation	.68	.84	.72	.75	.92
Barrier: Worries	.81	.72	.71	.66	.76
Barrier: Reasons	.67	.58	.76	---	.79
Barrier: Time Constraints	.78	---	.90	.58	---
Medical-care Satisfaction	.88	---	---	---	---

A Schwerin, Garland, and Corcoran (1995)
B Norman and Fitter (1989)
C Norman and Fitter (1991)
D Norman (1993)
E Norman and Conner (1993)
* Serious and Health Problems were combined into one scale.

The first scale, General Health Beliefs, is composed of three subscales. The first subscale measures health value ("How important do you think it is that people take special care of their health?"), the second subscale measures health comparison ("Compared to other people of your age, would you say you get ill much more/less often?"), and the third general health beliefs subscale measures illness activities ("When I'm ill I try to keep going on as usual.").

The next series of scales directly measure the HBM. Perceived Susceptibility asks the individual's perceived vulnerability to health problems (weight problems, high blood pressure) and serious conditions (cancer, heart disease, stroke, heart attack).

Perceived Severity measures the respondent's level of concern over health problems (weight problems, high blood pressure) and serious conditions (cancer, heart disease, stroke, heart attack).

Perceived Benefits is measured by a single item: "How effective do you think health

screening is in reducing your chances of getting a serious illness?"

Finally, Perceived Barriers is measured by four subscales: time constraints ("I would have problems getting an appointment."), motivation ("I'm too lazy."), reasons ("I'm already seeing the doctor a lot."), and worries ("Fear of the results of screening -- of what they might find.").

An item of health care avoidance ("Have you avoided going to the medical department aboard this ship during the past 30 days when you felt you needed medical-care or advice?") and a series of five items measuring health care satisfaction aboard ship (quality of medical services, the amount of privacy during the visit, waiting time, availability of medications, availability of medical supplies) were included in all analyses.

Demographic variables included in these analyses include age, sex, race, and marital status. For discriminant function analyses, only the demographic variable for age was included in analyses due to the requirement that discriminator variables represent continuous dimensions and satisfy the requirements for the ordinal level of measurement [42].

The dependent measure for intent to utilize health care or not utilize health care was measured by the item, "During the past 30 days, how many times did you visit sick call, a medical doctor, or other health care provider to obtain care for yourself?" Participants could provide a dichotomous response ("yes"/"no") and specify the number of visits in the past 30 days if they did utilize health care.

Procedure

The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign an informed consent form and complete the survey while the study coordinators were present, When, due to shipboard activity, it was not practical for all study subjects to remain in one area, surveys were distributed, and the participants were allowed to complete them in their work spaces. All completed surveys were sealed in envelopes and collected by study staff. Testing time of the entire survey was approximately 45 min.

RESULTS

A MANOVA examining gender differences among HBM variables indicated significant differences at the multi variate level (Wilks Lambda = .90, df = 15, 1040, $p < .001$). Subsequent univariate analyses indicated women aboard ship report higher medical-care avoidance (when medical-care or advice is needed); more positive perceptions of health value; more perceived illness when compared to others their own age (health comparison); greater perceived susceptibility to health problems; greater perceived susceptibility to serious health conditions; and

greater perceived barriers, such as "worries" (fear of screening results and procedures) and "reasons" ("I might be told off."). Men report significantly greater health care satisfaction (see Table 2).

Table 2. Univariate F-tests: Means and standard deviations[1] of Health Belief Model subscales between females and males, U.S. Navy Women Aboard Ship study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	FEMALE HBM MEAN (st dev)	MALE HBM MEAN (st dev)
Age	25.69 (5.99)	25.99 (6.64)
Medical-care Avoidance	1.45 (0.49)***	1.26 (0.44)
Health care Satisfaction	3.37 (0.94)	3.65 (0.85)***
Health Value	3.27 (0.64)**	3.14 (0.69)
Health Comparison	1.45 (0.79)***	1.27 (0.62)
Illness Activities	2.06 (0.65)	2.00 (0.68)
Perceived Susceptibility to Health Problems	1.90 (0.74)***	1.61 (0.67)
Perceived Susceptibility to Serious Conditions	1.54 (0.60)*	1.47 (0.59)
Perceived Severity to Health Problems	2.58 (0.88)	2.46 (0.87)
Perceived Severity to Serious Conditions	3.04 (1.10)	3.06 (1.11)
Perceived Benefits	2.75 (0.85)	2.77 (0.84)
Perceived Barrier-Time Constraint	2.18 (0.61)	2.11 (0.64)
Perceived Barrier-Motivation	1.75 (0.59)	1.77 (0.59)
Perceived Barrier-Reasons	1.85 (0.58)*	1.76 (0.51)
Perceived Barrier-Worries	1.90 (0.67)***	1.74 (0.57)

[1] Standard deviations are indicated in parentheses.

* Indicates groups are significantly different at the univariate level; $p(1, 1{,}054) < .05$.

** Indicates groups are significantly different at the univariate level; $p(1, 1{,}054) < .01$.

*** Indicates groups are significantly different at the univariate level; $p(1, 1{,}054) < .001$.

In a test of gender differences in health care utilization, a chi-square test of significance indicated that shipboard women report health care utilization during the past 30 days significantly more than do men (women = 69%, men = 31%; chi-square = 40.85, df = 1, $p < .001$). Due to these significant gender differences, analyses of the remaining demographic variables were performed separately for women and men. Results for separate female and male chi-squared analyses indicated no significant differences in health care utilization due to race or marital status.

Due to significant gender differences on health care utilization, separate MANOVA analyses were conducted for women and men on HBM variables. For women, results indicated statistically significant differences between groups at the multi variate level (Wilks Lambda = .93, df = 14, 519, p < .001). Subsequent examination of univariate F-ratios indicated significant differences between the health care user and nonuser groups in health value, health comparison (more perceived illness than others their age), and "reasons" barriers ("I might be told off," "I'm already seeing the doctor a lot," "I don't know enough about it"). For men, results indicated no statistically significant differences between groups at the multi variate level (Wilks Lambda = .94, df = 14, 519, ns.). Subsequent examination of univariate F-ratios indicated significant differences between the health care user and nonuser groups in health value and perceived barriers due to motivation (see Table 3).

Table 3. Univariate F-tests: Means and standard deviations[1] of Health Belief Model subscales between health care users and health care nonusers, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	FEMALE HC USER MEAN (st dev)	FEMALE HC NONUSER MEAN (st dev)	MALE HC USER MEAN (st dev)	MALE HC NONUSER MEAN (st dev)
Age	25.63 (6.01)	25.49 (6.01)	26.46 (5.99)	25.75 (6.64)
Medical Care Avoidance	1.47 (0.50)	1.41 (0.49)	1.25 (0.44)	1.26 (0.44)
Health Care Satisfaction	3.42 (0.96)	3.37 (0.87)	3.76 (0.86)*	3.57 (0.84)
Health Value	3.32 (0.62)*	3.17 (0.68)	3.20 (0.65)	3.10 (0.72)
Health Comparison	1.53 (0.85)*	1.36 (0.66)	1.28 (0.68)	1.25 (0.60)
Illness Activities	2.11 (0.64)	2.02 (0.70)	2.05 (0.74)	1.98 (0.67)
Perceived Susceptibility to Health Problems	1.93 (0.75)	1.84 (0.69)	1.59 (0.72)	1.63 (0.63)
Perceived Susceptibility to Serious Conditions	1.57 (0.60)	1.52 (0.58)	1.44 (0.55)	1.49 (0.60)
Perceived Severity to Health Problems	2.65 (0.84)	2.53 (0.91)	2.55 (0.92)	2.47 (0.84)
Perceived Severity to Serious Conditions	3.13 (1.02)	2.97 (1.15)	3.14 (1.12)	3.10 (1.06)
Perceived Benefits	2.67 (0.88)	2.77 (0.82)	2.72 (0.85)	2.76 (0.84)
Perceived Barrier-Time Constraint	2.17 (0.62)	2.21 (0.59)	2.09 (0.69)	2.13 (0.59)
Perceived Barrier-Motivation	1.73 (0.57)	1.76 (0.58)	1.66 (0.56)	1.83 (0.60)*
Perceived Barrier-Reasons	1.92 (0.59)*	1.75 (0.52)	1.69 (0.52)	1.79 (0.49)
Perceived Barrier-Worries	1.93 (0.67)	1.85 (0.64)	1.62 (0.52)	1.79 (0.60)

[1] Standard deviations are indicated in parentheses.

* Indicates groups are significantly different at the univariate level; p(1,440) < .05 for females; p(1,399) < .05 for males.

In an analysis of health care utilization for women, results indicated a single discriminant function (canonical correlation = .27, Wilks Lambda = .92; chi-square = 33.58, df = 15, $p < .01$). Three significant discriminating variables emerged as significant discriminators of health care utilization: health value, health comparison, and "reasons" barriers (see Table 4). For men, a single, nonsignificant discriminant function (canonical correlation = .21, Wilks Lambda = .95; chi-square = 18.36, df = 15, ns.) was derived. Four significant discriminating variables emerged from this analysis: health care satisfaction, motivation barriers, "reasons" barriers, and "worries" barriers. Group centroids for separate female and male discriminant functions appear in Table 5 (see Table 5). Multi variate omega squared indicated that the proportion of variance accounted for by the function is attributable to group differences. For shipboard women and men, 7% and 4% of the variance is attributable to group differences, respectively.

Table 4. Standardized canonical discriminant function coefficients and function correlations for females (n = 442) and males (n = 399), U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	COEFFICIENT FOR FEMALES	CORRELATION TO FUNCTION	COEFFICIENT FOR MALES	CORRELATION TO FUNCTION
Age	0.18	0.06	-0.17	-0.24
Medical-care Avoidance	0.21	0.22	-0.06*	0.04
Health care Satisfaction	0.44	0.08	-0.45	-0.47
Health Value	0.34**	0.41	-0.16	-0.30
Health Comparison	0.21*	0.38	-0.16	-0.09
Illness Activities	0.03	0.23	-0.07	-0.21
Perceived Susceptibility-Health Problems	0.15	0.23	-0.02	0.11
Perceived Susceptibility-Serious Conditions	-0.10	0.12	0.20	0.20
Perceived Severity-Health Problems	0.04	0.25	-0.19	-0.20
Perceived Severity-Serious Conditions	0.20	0.26	0.17	-0.07
Perceived Benefits	-0.27	-0.20	0.31	0.09
Perceived Barrier-Time Constraint	-0.28	-0.13	-0.34	0.13
Perceived Barrier-Motivation	-0.28	-0.10	0.49**	0.64
Perceived Barrier-Reasons	0.92**	0.56	0.03*	0.45
Perceived Barrier-Worries	-0.17	0.20	0.45**	0.64

* Coefficients are significant ($p < .05$)

** Coefficients are significant ($p < .01$)

Table 5. Group centroids for separate discriminant functions for females and males, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

GROUP	CENTROIDS FOR FEMALES	CENTROIDS FOR MALES
Health care User	0.25	-0.3
Health care Nonuser	-0.33	0.16

For shipboard women, correct group classification occurred for 63% (280/442) of the cases from the derivation sample. This exceeded the proportion of correct classifications expected by chance (45%), $z = 7.55$, $p < .001$. For the cross-validation sample, correct group classifications occurred for 53% of the cases (47/89). This also exceeded the proportion of correct classifications expected by chance (35%), $z = 3.56$, $p < .001$ (see Table 6).

Table 6. Predicted group membership for derivation and validation samples for the female discriminant function, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	PREDICTED GROUP MEMBERSHIP	
ACTUAL GROUP MEMBERSHIP	**Health care USER**	**Health care NONUSER**
DERIVATION SAMPLE		
Health care User	**201**	51
Health care Nonuser	111	**79**
CROSS-VALIDATION SAMPLE		
Health care User	**25**	11
Health care Nonuser	31	**22**

Note: Correct predictions are in **boldface**. The percentage of cases correctly classified for the derivation sample is 280/442 = 63.35%. Classification rate for the validation sample is 47/89 = 52.81%.

For the men, correct group classification occurred for 66% (265/399) of the cases from the derivation sample. This exceeded the proportion of correct classifications expected by chance (62.15%), $z = 1.76$, $p < .05$. For the cross-validation sample, correct group classifications occurred for 58% of the cases (74/128). The predictive accuracy of the cross-validation sample was not significantly greater than chance (56%; $z = 0.04$, ns.; see Table 7).

Table 7. Predicted group membership for derivation and validation samples for the male discriminant function, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	PREDICTED GROUP MEMBERSHIP	
ACTUAL GROUP MEMBERSHIP	**Health care USER**	**Health care NONUSER**
DERIVATION SAMPLE		
Health care User	**17**	120
Health care Nonuser	14	**248**
CROSS-VALIDATION SAMPLE		
Health care User	**2**	48
Health care Nonuser	6	**72**

Note: Correct predictions are in **boldface**. The percentage of cases correctly classified for the derivation sample is 265/399 = 66.42%. Classification rate for the validation sample is 74/128 = 57.81%.

DISCUSSION

This research study sought to identify and examine HBM variables that may discriminate between shipboard Navy personnel who utilize health care and those who do not. Findings from this study suggested that women report significantly more health care utilization than men do. This supports the findings of Nice and Hilton [1] in which female Navy personnel utilized health care significantly more than did males. Although men appear to be significantly more satisfied with shipboard health care and women claim that they have avoided health care utilization within the past 30 days when they needed it, women may see the need to use health care more than men do. Women reported significantly greater ratings of health value, greater ratings of perceived illness (compared to people their own age), greater perceived susceptibility to health problems, and greater perceived susceptibility to serious illness than do men.

Among women, the HBM appears to be an effective theoretical model for predicting health care use. Although the amount of variance accounted for by the variables in the analysis is low (7%), it is somewhat comparable to the amount of variance (16%) accounted for by another examination of HBM variables among women seeking mammography screening [43]. Additionally, the HBM's predictive value in categorizing the cross-validation or "hold-out" sample in the present study is significantly better than chance.

Items measuring the perceived "reasons" barriers to health care use appear to discriminate between health care use groups among women, yet they may not be indicative of a barrier. An examination of mean scores indicated that items may lack predictive validity since elevated scores of barriers to health care use should appear among nonusers. That, coupled with having to exclude one of the original items due to low item-total correlations, suggests that further

psychometric work is needed on this subscale.

Among shipboard men, the HBM did not appear to be an effective theoretical model for predicting health care use. Group differences between health care users and nonusers at the univariate level indicate that significant barriers to health care utilization consist of motivational barriers ("I'm too lazy," "I'm uninterested").

Two notes of caution might be sounded concerning the generalizability of these results. The dependent measure of health care utilization was a self-report of their health care during a 30-day period prior to the survey administration. A dependent measure that included actual health care utilization (e.g., sick call visits) might more accurately characterize health care attendance behavior. Also, this study examined an exclusively military population. Although military and civilian health care utilization have been shown to be comparable [1], the dynamics of health care utilization among military personnel may be very different.

In addition, subject attention and motivation might be an uncontrolled source of variance. The HBM instrument was a part of a much larger research effort in which survey forms ranged from 22 to 25 pages (70-73 items, respectively). A great deal of medical, psychological, and sociological information was requested from study participants. Since the HBM examines motivational aspects of health care utilization, any feature of the study that might cause more highly motivated participants to complete the questionnaire while causing less motivated subjects to decline participation would be a concern.

This study supports the HBM in explaining behavior among shipboard female personnel, although additional research is needed to better explain male health care utilization behavior. These findings indicated aspects of health care where medical program implementors could collaborate among their specializations (physicians, nurses, health care administrators, program evaluators) to form a health care utilization education program. Such a program could educate the end user about health care of the availability and benefits of military health care while reducing utilization barriers. Meanwhile, military medical departments could examine the utilization barriers and determine what institutional changes could be altered to enhance health care utilization.

NOTES:

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APPENDIX 1

Health Beliefs Model Questionnaire Items and Constructs

Health Beliefs Model Questionnaire (Norman & Fitter, 1989; Norman & Fitter, 1991). All items are answered on a scale of 1-4, from very extremely negative, negative, positive, very positive (e.g., "1 = not at all often, 2 = not often, 3 = often, 4 = very often."

General Health Beliefs.

Health Value

44. How often do you think about your health?
45. How concerned are you about your health?
46. How important do you think it is that people take special care of their health?
47. How likely is it that you will try to do a better job of taking care of your health in the future?

Health Comparison

48. Compared to other people of your age, would you say you get ill much more/less (neg keyed) often?
49. Compared to other people of your age, when you do get ill would you say you get much more/less (neg keyed) often?
50. I seem to resist illness better than other people.

Illness Activities

51. In general, when you get ill, how much does it interfere with your usual activities?
52. When I'm ill I try to keep going on as usual.
53. When I'm ill I cut back on whatever I'm doing in order to get well.

Perceived Susceptibility. How likely do you feel, it is that you will develop any of the following problems in the next 12 months?

Health Problems

54. Weight problems
55. High blood pressure

Serious Conditions

56. Cancer
57. Heart disease
58. Stroke
59. Heart attack

Perceived Severity. How serious a health problem do you think the following would be if you were to develop them?

Health Problems

60. Weight problems
61. High blood pressure

Serious Conditions

62. Cancer
63. Heart disease
64. Stroke
65. Heart attack

Perceived Benefits.

66. How effective do you think health screening is in reducing your chances of getting a serious illness?

Perceived Barriers. Which of the following reasons would stop you from attending a screening appointment?

Time Constraints

67. It would take up a lot of my spare time.
68. I would have problems getting to an appointment.
69. It would be too much effort.
70. I have other more important things to do.

Motivation

71. I'm uninterested.
72. I'm too lazy.

Reasons

73. I might be "told off."
74. I already feel healthy.
75. I don't know enough about it.
76. I'm already seeing the doctor a lot.

Worries

77. Fear of the results of screening -- of what they might find.
78. It would be embarrassing.
79. Would you be worried about any aspects of a screening appointment?

Health care Satisfaction

80. If your most recent medical-care visit was aboard ship, how satisfied were you with the: Quality of medical services provided.
81. If your most recent medical-care visit was aboard ship, how satisfied were you with the: Amount of privacy you had during the visit.
82. If your most recent medical-care visit was aboard ship, how satisfied were you with the: Amount of time you waited at the facility to see a health care provider.
83. If your most recent medical-care visit was aboard ship, how satisfied were you with the: Availability of medications.
84. If your most recent medical-care visit was aboard ship, how satisfied were you with the: Availability of medical supplies.

Medical-care Avoidance

85. Have you avoided going to the medical department aboard this ship during the past 30 days when you have felt you needed medical-care or advice?

Medical Visits

86. During the past 30 days, how many times did you visit sickcall, a medical doctor, or other health care provider to obtain care for your self?

_____ I did not visit sickcall or a health care provider during the past 30 days.

_____ I visited sickcall or a health care provider(s): ____ time(s) during the past 30 days.

APPENDIX G.5

Prevalence Rates of Upper Respiratory Disease Symptoms and Reported Shipboard Conditions and Exposures Among Active Duty Navy Personnel Assigned to Ships

Edward D. Gorham, M.P.H.

REPORT TOPIC AREA: PREVALENCE RATES OF UPPER RESPIRATORY DISEASE SYMPTOMS AND REPORTED SHIPBOARD CONDITIONS AND EXPOSURES AMONG ACTIVE DUTY PERSONNEL ASSIGNED TO SHIPS

LEAD AUTHORS: Edward D. Gorham, M.P.H.

ABSTRACT

Upper respiratory tract infection (URI) is the leading cause of outpatient morbidity in Navy personnel assigned to ships. However, associations between risk of URI and specific shipboard living conditions such as occupational exposures to exhaust and dust, berthing and work place occupancy, and prevalence rates of current smoking are not well defined. This preliminary report contains descriptive analyses of reported prevalence of cold and sinus symptoms as well as shipboard conditions which may be associated with URI. The overall prevalence rates of cold symptoms experienced over the previous 30 days was 54% in women and 45% in men. The overall prevalence rate of sinus symptoms was 37% in women and 29% in men. The median number of people sharing berthing spaces was 50 among the junior and mid-level enlisted pay grades and 24 among senior enlisted. The median number of people sharing work places was 8-12 and was similar across enlisted ranks, although the median was slightly lower among the most senior enlisted. Officers had about half the work place occupancy as enlisted personnel. Exposure to diesel exhaust within fifty feet was reported 53% more commonly in men (23%) than women (15%). Exposure to dust and particles was reported about equally commonly in men and women, with an overall exposure rate of 50%. Prevalence rates of current smoking were approximately 36% in men and 33% in women. The preliminary analyses in this descriptive study will allow testing of the associations between URI symptoms and potential risk factors associated with major aspects of shipboard life.

INTRODUCTION

Acute upper respiratory infections (URIs) encompass a large group of illnesses of known or suspected viral origin, but which can be complicated by bacterial infection [1]. Clinically, URIs are often divided according to whether fever is present. Known viral agents causing acute febrile respiratory diseases (ICD-9 codes 461-466,480) include parainfluenza viruses, adenoviruses, rhinoviruses, respiratory syncytial virus, and some coronaviruses, coxsackieviruses, and echoviruses. The symptoms of these viral infections include fever, headache, general achiness, and cold-like symptoms. The other major category of URIs in which fever is generally absent, except in young children, is the common cold (ICD-9 code 460). These infections are characterized by sneezing, lacrimation, nasopharyngeal irritation, and chills [1]. Over 100 serotypes of rhinovirus have been identified as agents for colds along with a few coronaviruses, but virus can be demonstrated in cell or tissue culture in only 20 to 35 percent of cultured cases [1]. It has been estimated that the etiologic agents responsible for almost one-half of all colds are unknown [1,2].

Health and Social Impact of URIs. Upper respiratory tract diseases are the most common infectious diseases among adults in the United States [2]. Acute URIs also cause significant morbidity and mortality among children and older adults [1]. The health threat which URIs pose to children and older adults, and the magnitude of acute disability which URIs account for in adults, make them a major health and economic concern. In the United States, acute respiratory disease annually accounts for an estimated 1.25 million hospitalizations and 75 million physician visits. The direct medical costs for URIs have been estimated at 15 billion dollars annually and the indirect cost associated with absenteeism and lost income due to URIs approaches 60 billion dollars annually [3].

Despite several epidemiologic and serologic investigations of acute URI in military [4-8] and civilian populations [9,10], acute upper respiratory disease is still the leading cause of outpatient morbidity in many civilian and military populations, including active-duty Navy personnel assigned to ships [11].

Occupancy and Ventilation. Ship assignment is associated with high occupancy living and working conditions and aggregation of many susceptible individuals [5]. Most of the leading infectious agents known to cause respiratory illness are transmissible through indoor air [11,12]. A few studies have reported associations between ventilation characteristics of buildings and acute upper respiratory disease incidence [6,8,9]. Brundage, et al [16] found that incidence rates of acute febrile respiratory diseases at four Army training centers were 50 percent higher in buildings with closed ventilation systems. A cross-sectional survey reported that rhinitis was five times as prevalent (28 percent versus 5 percent) in air-conditioned buildings compared with naturally ventilated buildings [8]. The present study was undertaken to describe the prevalence rates of reported cold and sinus symptoms as well the prevalence of rates of current smoking, occupational exposures to exhaust and dust, and high berthing and workplace occupancy which may be associated with upper respiratory disease risk in U.S. Navy personnel assigned to ships.

METHODS

This study is part of the Women Aboard Navy Ships Comprehensive Health and Readiness Research Project conducted at the Naval Research Center in San Diego, California as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. This epidemiologic research project utilizes several data collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important characteristics. The study has a longitudinal design with women and men enrolled in Year 1 of the study being contacted again and re-surveyed on a 12-month cycle in Year 2. All women reporting aboard ship (and matched men) in Year 2 also will be enrolled. This is a report of Year 1 survey results based on 9 months of data collected.

Population. All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1. An equal number of men serving aboard ship matched on relevant characteristics were also eligible. The Navy Bureau of Personnel (PERS-OOW) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were determined to be eligible for inclusion in the study.

This report is based on the first 22 ships surveyed. These ships were surveyed based on availability as determined by the Commanding Officer and Medical Department of each ship. The ships included the U.S.S.: Barry, Camden, Cape Cod, Comstock, Coronado, Curtis Wilbur, Dixon, Emory S. Land, Grapple, Grasp, Holland, Kiska, L.Y. Spear, Monongahela, Mount Baker, Mount Hood, Platte, Rainier, Santa Barbara, Shenandoah, Supply, and Yellowstone. These 22 ships had 3,813 women and 11,985 men assigned aboard.

Survey Development. Several methods were used for the development of the U.S. Navy Shipboard Health Survey used in this study, including the following: 1) review of extant questionnaires, literature, and standard scales, 2) convening of a panel of subject matter experts, 3) elicitation of major issues from knowledgeable sources, and 4) review of Navy requirements concerning the reporting of women's health and access to health care.

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities [13, 14] were reviewed and adopted for use in this study. The questionnaires developed by the CDC included the National Health Interview Survey [15], the Health Interview Survey Form HIS-1 (1992) and HIS-2 (1992) [16, 17], the National Ambulatory Health Care Survey for 1993, 1995, and 1996 [18], and the Youth Behavior Survey [19]. Previous questionnaires developed by the Naval Health Research Center also were reviewed, and ranged from nutrition surveys to patient care surveys. In addition, a series of scales and inventories were reviewed and selected for use. These standard scales included but were not limited to: Center for Epidemiological Studies Depression Scale (CES-D) [20], a scale which measures the current frequency of depressive symptoms, and the Quality of Life Scale [21], a four-item scale previously used in research on Navy populations.

Survey Administration. The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign informed consent and to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all study subjects to remain in one area, surveys were distributed, and the participants were allowed to fill them out in work spaces. The completed surveys were collected by study staff in sealed envelopes in all cases.

Response Rates. The overall median ship response rate for the 22 ships was 65.1%, and the overall mean response rate was 56.5%. The overall median response rate for women was

67.4%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had an overall median response rate of 74.7% compared to ships with more than 100 women assigned, which had an overall median response rate of 49.6%.

Statistical Analyses. Frequencies were computed for each variable of interest to yield the prevalence rates of reported symptoms of colds and sinus conditions, as well as prevalence rates for potential independent variables for subsequent analysis, including the prevalence of current smoking, diesel exposure, exposure to dust and particles, and occupancy in berthing and working areas. Significance levels of prevalence rates were assessed using 95 percent confidence levels based on the Normal approximation to the Binomial distribution [22]. Associations with pay grade were tested using a Chi-square test for linear trends [23]. The median test and Chi-square test were used to assess differences in median occupancy [22].

RESULTS

Cold and Sinus Symptoms. Overall, women reported an 18 percent higher prevalence rate of cold symptoms (Table 1) and a 28 percent higher prevalence rate of sinus symptoms (Table 2) then men. These differences were most noteworthy in the junior and mid-level pay grades (i.e., E1-E3 and E4-E6).

Current Smoking. Prevalence rates of current smoking were approximately 34 percent and did not differ significantly by gender (Table 3). Prevalence rates among senior enlisted women (i.e., E7-E9) were higher than those of the junior and mid-level paygrades (i.e., E1-E3 and E4-E6).

Berthing Occupancy. The median number of people sharing berthing spaces was twice as high among the junior and mid-level pay grades (i.e., E1-E3 and E4-E6) then among the senior enlisted ranks (i.e., E7-E9). Berthing area occupancy was about 20 percent lower overall among women compared to men, and was three times lower among the senior enlisted women compared to senior enlisted men (Table 4).

Workplace Occupancy. The median number of people sharing workplaces was similar for men and women and was similar across enlisted ranks although workplace occupancy declined slightly among the most senior enlisted for both men and women. Officers reported about half the workplace occupancy as enlisted personnel (Table 5).

Diesel Exhaust Exposure. Prevalence of exposure to diesel exhaust within fifty feet was reported about 53 percent more commonly among men compared to women (Table 6). An overall trend of increasing exposure with increasing pay grade was present among enlisted men and women, particularly as pay grade increased from junior (E1-E3) to mid-level (E4-E6).

PRELIMINARY REPORT

Table 1. Number and prevalence rate of reported cold symptoms in the last 30 days by gender and pay grade. U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN					WOMEN				
				95 PERCENT CONFIDENCE INTERVAL					95 PERCENT CONFIDENCE INTERVAL	
PAY GRADE	NUMBER REPORTING SYMPTOMS	POPULATION	PERCENT REPORTING SYMPTOMS	LOWER	UPPER	NUMBER REPORTING SYMPTOMS	POPULATION	PERCENT REPORTING SYMPTOMS	LOWER	UPPER
E1-E3	262	620	42.3	38.0	46.0	406	689	58.9	55.0	63.0
E4-E6	591	1265	46.7	44.0	49.0	633	1218	52.0	49.0	55.0
E7-E9	48	109	44.0	35.0	54.0	39	90	43.3	33.0	54.0
Officers	34	91	37.4	27.0	48.0	44	97	45.4	37.0	58.0
Not reported	13	40	32.5	19.0	49.0	13	30	43.3	25.0	63.0
Total*	948	2125	44.6	42.0	47.0	1135	2124	53.4	51.0	56.0

*Excludes respondents not reporting presence or absence of cold symptoms (16 men and 45 women) or gender (n=27)

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Table 2. Number and prevalence rate of reported sinus symptoms in the last 30 days by gender and pay grade. U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN					WOMEN				
				95 PERCENT CONFIDENCE INTERVAL					95 PERCENT CONFIDENCE INTERVAL	
PAY GRADE	NUMBER REPORTING SYMPTOMS	POPULATION	PERCENT REPORTING SYMPTOMS	LOWER	UPPER	NUMBER REPORTING SYMPTOMS	POPULATION	PERCENT REPORTING SYMPTOMS	LOWER	UPPER
E1-E3	177	609	29.1	26.0	33.0	236	679	34.8	31.0	38.0
E4-E6	360	1253	28.7	26.0	31.0	453	1199	37.8	35.0	41.0
E7-E9	35	107	32.7	24.0	42.0	41	88	46.6	36.0	58.0
Officers	18	89	20.2	12.0	30.0	34	96	35.4	26.0	47.0
not reported	10	39	25.6	13.0	42.0	11	32	34.4	19.0	53.0
Total*	600	2097	28.6	27.0	31.0	775	2094	37.0	35.0	39.0

*Excludes respondents not reporting presence or absence of cold symptoms (44 men and 75 women) or gender (n=27).

PRELIMINARY REPORT

Table 3. Number and prevalence rate of current smoking by gender and pay grade. U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN					WOMEN				
				95 PERCENT CONFIDENCE INTERVAL					95 PERCENT CONFIDENCE INTERVAL	
PAY GRADE	NUMBER REPORTING SMOKING	POPULATION	PERCENT REPORTING SMOKING	LOWER	UPPER	NUMBER REPORTING SMOKING	POPULATION	PERCENT REPORTING SMOKING	LOWER	UPPER
E1-E3	243	624	38.9	35.0	43.0	244	699	34.9	31.0	39.0
E4-E6	462	1275	36.2	34.0	39.0	404	1244	32.5	30.0	35.0
E7-E9	44	111	39.6	31.0	49.0	46	91	50.5	40.0	61.0
Officers	18	91	19.8	12.0	29.0	13	98	13.3	7.0	22.0
Not reported	13	40	32.5	19.0	49.0	10	37	27.0	14.0	44.0
Total*	780	2141	36.4	34.0	38.0	717	2169	33.1	31.0	35.0

*Excludes respondents not reporting gender (n=27).

Table 4. Median Number of people reported occupying common sleeping quarters by gender and pay grade. U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN				WOMEN			
PAY GRADE	NUMBER REPORTING OCCUPANCY	MEDIAN OCCUPANCY REPORTED	25TH PERCENTILE	75TH PERCENTILE	NUMBER REPORTING OCCUPANCY	MEDIAN OCCUPANCY REPORTED	25TH PERCENTILE	75TH PERCENTILE
E1-E3	589	50	30	100	666	45	22	70
E4-E6	1215	50	30	100	1194	45	23	74
E7-E9	109	24	13	38	86	8	3	15
Officers	90	1	1	1	93	1	1	1
Not reported	37	60	30	78	33	30	14	60
Total*	2040	50	25	99	2072	40	20	70

*Excludes respondents not reporting berthing space occupancy (101 men and 97 women) or gender (n=27).

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PRELIMINARY REPORT

Table 5. Median number of people reported occupying common working quarters by gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN				WOMEN			
PAY GRADE	NUMBER REPORTING OCCUPANCY	MEDIAN OCCUPANCY REPORTED	25TH PERCENTILE	75TH PERCENTILE	NUMBER REPORTING OCCUPANCY	MEDIAN OCCUPANCY REPORTED	25TH PERCENTILE	75TH PERCENTILE
E1-E3	590	11	6	20	657	10	6	20
E4-E6	1241	12	6	20	1207	10	5	17
E7-E9	109	9	4	15	85	8	5	15
Officers	88	5	3	12	98	6	4	12
Not reported	37	12	4	20	34	7	4	19
Total*	2065	11	6	20	2081	10	5	17

*Excludes respondents not reporting working space occupancy (76 men and 88 women) or gender (n=27).

Table 6. Number and prevalence rate of reported exposure to diesel exhaust within 50 feet by gender and pay grade, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN					WOMEN				
PAY GRADE	NUMBER REPORTING EXPOSURE	POPULATION	PERCENT REPORTING EXPOSURE	95 PERCENT CONFIDENCE INTERVAL		NUMBER REPORTING EXPOSURE	POPULATION	PERCENT REPORTING EXPOSURE	95 PERCENT CONFIDENCE INTERVAL	
				LOWER	UPPER				LOWER	UPPER
E1-E3	102	607	16.8	14.0	20.0	81	687	11.8	9.0	14.0
E4-E6	316	1244	25.4	23.0	28.0	197	1224	16.1	14.0	18.0
E7-E9	36	107	33.6	25.0	43.0	13	87	14.9	8.0	24.0
Officers	20	88	22.7	14.0	33.0	21	95	22.1	13.0	30.0
Not reported	4	39	10.3	3.0	24.0	5	36	13.9	5.0	29.0
Total*	478	2085	22.9	21.0	25.0	317	2129	14.9	13.0	16.0

*Excludes respondents not reporting exposure to diesel exhaust (56 men and 40 women) or gender (n=27)

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PRELIMINARY REPORT

Table 7. Number and prevalence rate of reported exposure to dust and particles by gender and pay grade. U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	MEN					WOMEN				
				95 PERCENT CONFIDENCE INTERVAL					95 PERCENT CONFIDENCE INTERVAL	
PAY GRADE	NUMBER REPORTING EXPOSURE	POPULATION	PERCENT REPORTING SYMPTOMS	LOWER	UPPER	NUMBER REPORTING EXPOSURE	POPULATION	PERCENT REPORTING EXPOSURE	LOWER	UPPER
E1-E3	291	606	48.0	44.0	52.0	331	680	48.7	45.0	52.0
E4-E6	636	1235	51.5	49.0	54.0	626	1218	51.4	48.0	54.0
E7-E9	56	107	52.3	42.0	62.0	45	88	51.1	40.0	62.0
Officers	43	90	47.8	37.0	59.0	50	96	52.1	42.0	63.0
Not reported	13	39	33.3	19.0	50.0	20	33	60.6	42.0	77.0
Total*	1039	2077	50.0	48.0	52.0	1072	2115	50.7	49.0	53.0

*Excludes respondents not reporting exposure to dust and particles (64 men and 54 women) or gender (n=27)

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Dust and Particle Exposure. Prevalence of exposure to dust and particles was reported about equally commonly among men and women (Table 7) with an overall prevalence rate of 50 percent. No significant trend in exposure with respect to pay grade was present among men or women.

DISCUSSION

As expected based on a previous study of shipboard sick call visits [24], women reported higher prevalence rates of cold and sinus symptoms then men. Prevalence rates of current smoking in men and women aboard ship were similar and a general decline in prevalence of current smoking with increasing pay grade was observed. Berthing area median occupancy varied inversely with pay grade, however work area median occupancy did not differ across enlisted ranks. Officers had private sleeping quarters and generally reported about half the median workplace occupancy as enlisted personnel. Although exposure to diesel exhaust within fifty feet was reported more commonly by men then women, prevalence of exposure to dust and particles was reported about equally commonly among both men and women.

This analysis of the reported prevalence rates of cold and sinus symptoms among Navy personnel assigned to ships will allow testing of the potential associations between these dependent variables and specific independent variables including major aspects of shipboard life such as high berthing and workplace occupancy and occupational exposures to exhaust and dust. This analysis also demonstrates the need to control for enlisted rank and officer status as potential covariates in subsequent analyses, as these variables are associated with the reported prevalence of cold and sinus symptoms and with median occupancy and workplace exposures.

Notes:

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APPENDIX G.6

Comparison of Men and Women Aboard Navy Ships: Life Stress Conditions, Psychosocial Stress, Distress, Coping and Quality of Life Issues

James A. Martin, Ph.D., BCD

REPORT TOPIC AREA: COMPARISON OF MEN AND WOMEN ABOARD U.S. NAVY SHIPS: LIFE STRESS CONDITIONS, PSYCHOSOCIAL STRESS, DISTRESS, COPING AND QUALITY OF LIFE ISSUES

LEAD AUTHOR: James A. Martin, Ph.D., BCD

ABSTRACT

Military women are among the largest groups of women in our society involved in nontraditional employment. Selected military duty issues and aspects of military life are examined. These data represent the initial nine months of data collection in a comprehensive longitudinal study of health issues. Because of questionnaire length considerations, four alternate questionnaire versions were administered to a total of 2,167 women chosen randomly based on their social security numbers. The psychosocial measures used in this report were administered in two of the four questionnaires for a total of 50% of the overall sample of women and a matched sample of men. The current analysis includes 1,064 women and 1,039 men. The overall median response rate for women was 67.4%. Life stress conditions, perceived stress, duty and personal life performance, coping, psychological distress, and quality of life variables are examined in both descriptive and multivariate analyses. While there are some gender differences, the most important differences are among rank groups. Certain aspects of assignment to shipboard status and various duty issues are associated with substantial perceived stress, high levels of psychological distress, and reduced well-being for both men and women. Participants are generally positive about the personal and family aspects of their overall quality of life.

INTRODUCTION

American women have a long and illustrious history of military service including important contributions in World War II, the war in Viet Nam, the Korean Conflict , and the Gulf War [1, 2]. The military women's memorial in Washington, DC and the hall in the Pentagon dedicated to women's military service and sacrifice, pay a well-deserved tribute to these remarkable contributions.

More than 200,000 women were on active duty status in 1995 (DMDC, 1995). This represented 14 percent of all active duty Armed Services personnel. While many women serve in military occupations that represent "traditional" jobs for women in our society (health care and various types of administrative, service, and supply functions), increasing numbers of women are occupying non-traditional roles (IOM Report, 1995). Women are being fully integrated into combat service and service support units in all the Services and they are being deployed throughout the world in a full range of combat and peacekeeping operations. The Armed Services represent the largest single nontraditional work setting for women in our society. When these

women transition back to civilian life after completing their service commitment, they bring an important set of work and life experiences with them.

Approximately 12.9% of Navy officers are women and 11.7% of Navy enlisted personnel are women (DMDC, 1995). Women have been assigned to the Navy's non-combatant ships since 1978. Almost 9000 women were serving on board U.S. Navy ships at the time of this study (1995). Their duty roles involve assignments on almost all types of ships (submarines, with extremely limited sleeping space, are the primary exception). Women serve on Hospital Ships, Destroyer and Submarine Tenders, Ammunition Ships, Combat Support Ships, Amphibious Landing and Assault Ships, Oilers, Salvage Ships, as well as Destroyers and Nuclear Aircraft Carriers.

The Navy's intent to have women serve on all types of ships (except submarines) and in a wide array of occupational roles, means that larger numbers of women face health and safety risks associated with what should be considered an "industrial environment." Like their male counterparts, these women confront the biopsychosocial stress associated with military deployments, long duty hours, separations from family and friends, and the possible exposure to combat and other stressful military operations. These women confront issues of social integration in what has historically been an all-male domain. All of these issues have broadly defined health and well-being implications.

There have been a limited number of small scale studies of women's health issues related to service on board ship [3, 4, 5]. While these studies have examined some of the reasons for women's sick call visits and medical evacuations (including obstetric and gynecological issues), these studies have not provided a comprehensive examination of physical or psychosocial health risks. Issues related to the stressful nature of the occupational environment and the associated demands of military life warrant additional study.

The U.S. Navy Women Aboard Ship study that provides the basis for this article evolved from a 1994 Congressional Appropriation earmarked for the study of military specific health issues associated with women's' service in the Armed Forces. The major topics in this comprehensive study include: occupational health, health care delivery aboard ship, pregnancy, health promotion, psychosocial issues, and family-personal life issues. This article represents an initial look at some of these psychosocial data.

Psychosocial Research Issues

This article focuses on a number of broadly defined psychosocial domains. These include: (1) sources of stress in the "work and living environment" on board ship, as well as selected military life and personal life stress conditions; (2) the amount of perceived stress; (3) the impact of stress as it relates to perceived performance of military duties, personal life responsibilities, and overall coping; (4) the association between life stress conditions, overall current life stress

and psychosocial distress; and (5) the overall perception of quality of life and it's relationship to sources of stress, stress itself, and current levels of psychological distress.

The focus on women's assignment to ship duty represents an effort to understand what in the employment literature would be considered "a nontraditional occupation" [6]. While a considerable literature has developed regarding gender differences in the health effects of a variety of traditional and nontraditional work settings and conditions [7], there are no large scale longitudinal studies of the health and well-being of women in the nontraditional workplace.

This research is grounded in the extensive "stress and well-being" literature that evolved in the health and social science disciplines of psychology, psychiatry, sociology, social work, nursing, and epidemiology [8]. The focus on stress, stress response, and physical, psychological, and behavioral outcomes derives from the work of Mason [9], builds on the concepts of life stress events [10] and stressful life conditions [11], and the potential cumulative effects of daily stressors on physical, psychological, and behavioral health and well-being [12]. The concept of well-being, is rooted in the work of Campbell [13] and maintains its usefulness as demonstrated by the recent Secretary of Defense's interest in well being as an aspect of enhancing the quality of life for members of the military services and their families (Marsh Report, 1995).

The model for understanding the stress process derives primarily from the work of Lazarus [14] and includes both an understanding of the stress appraisal process, the concept of coping [15] and the full range of human responses that may be elicited by the stress-coping process [16].

Finally, this research builds on a long history of military-specific, stress and well-being research conducted by and for three premier Department of Defense laboratories: the Army Research Institute for the Social and Behavioral Sciences (ARI), the Walter Reed Army Institute of Research (WRAIR), and the Naval Health Research Center (NHRC).

METHODS

This study is part of the U.S. Navy Women Aboard Ship Comprehensive Health and Readiness Research Project conducted at the Naval Health Research Center in San Diego, California as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland.

This research project utilizes several data collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important demographic and status characteristics. The study has a longitudinal design. Women and men enrolled in Year 1 of the study will be contacted again and re-surveyed on a 12-month cycle in Year 2. All women

reporting aboard ship (and matched men) in Year 2 also will be enrolled. This is a report of Year 1 survey results, based on 9 months of data collection.

Population

All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1. An equal number of men serving aboard ship were matched to women based on relevant characteristics. The Navy Bureau of Personnel provided a listing of all ships with women assigned aboard. This listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were determined to be eligible for inclusion in the study. This report is based on the first 22 ships surveyed. These ships were surveyed based on availability as determined by the Commanding Officer and Medical Department of each ship. There were 3,453 women and 10,964 men assigned aboard these 22 ships.

Matching

The men included in this study were matched to women on the following characteristics: ship, work division, department, race (white, black, Hispanic, and other), pay grade (E1-E3, E4-E6, E7-E9, O1-O3, O4-O6), occupational (skill) rating (if no individual was available in the same rating, an individual with a closely related rating was selected), and date of birth (nearest date of birth, not to exceed plus or minus two years). In the infrequent instances where these criteria could not be met, men that matched as closely as possible to women were selected.

The procedure for selection of the matched men in the study was accomplished as follows: (1) the eligible population was determined using NHRC files, and an electronic roster was developed which included all data elements needed for matching; (2) the personnel department of each ship provided an electronic roster with limited information that was compared to the NHRC roster, and a final roster was determined; (3) a matching program was run to select the men to be included in the survey; and (4) individual identification labels were created and affixed to survey packets.

Survey Development

Several methods were used in the development of the U.S. Navy Shipboard Health Survey including the following: (1) review of existing questionnaires, literature, and standard scales, (2) convening of a panel of subject matter experts, (3) elicitation of major issues from knowledgeable sources, and (4) review of Navy requirements concerning the reporting of women's health and access to health care.

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities (Noris, 1990

& Bernstein, 1986) were reviewed and adopted for use in this study. The questionnaires developed by the CDC included the 1992 National Health Interview Survey (Health Interview Survey Form HIS-1 and HIS-2) and the National Ambulatory Health Care Survey for 1994, 1995, and 1996 (Centers for Disease Control and Prevention). Previous questionnaires developed by the Naval Health Research Center and the Walter Reed Army Institute of Research were reviewed, and selected scales and inventories from relevant military studies were selected for use.

Survey Administration

The overall administration plan included the distribution of individually identified packets with all necessary materials to each study participant. Whenever possible, participants were brought together in a common location aboard ship, briefed on the study, asked to sign an informed consent form and to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all participants to remain in one area, surveys were distributed, and the participants were allowed to fill them out in work spaces. The completed surveys were collected by study staff in sealed envelopes in all cases. The number of individuals who elected not to participate is not known. Those administering the survey believe that this number is very small but this is a component of the survey administration that has been corrected for subsequent survey administrations.

Response Rates

The overall median ship response rate for the 22 ships was 65.1%, and the overall mean response rate was 56.5%. The overall median response rate for women was 67.4%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had an overall median response rate of 74.7% compared to ships with more than 100 women assigned, which had an overall median response rate of 49.6%.

Instruments Included in the Current Analysis

Current Overall Life Stress and Sources of Stress - As a measure of overall current life stress, participants were asked to think about their whole life over the past 2 weeks and to rate on a Likert scale, "how much stress do you think is in your life right now." The recoded response categories range from zero (0) "none at all" to four (4) an "extreme amount." Participants were asked to say how much of this stress is related to any of a series of thirty-two possible life domains or current life experiences. These include ship duties, work and personal relationships aboard ship, living conditions aboard ship, as well as a number of current personal and family life issues related to military service. One item specifically refers to overall stress associated with being aboard ship. Each of the response categories is recoded on a Likert scale from zero (0) "not at all" to four (4) an "extreme amount." These items were developed for this study from a similar set of stress measures first used in a Walter Reed Army Institute of Research

(WRAIR) study of psychological adaptation during the Gulf War [17] and a study of adaptation of soldiers during the downsizing of U.S. personnel in Europe after the Gulf War [18].

Personal Life and Job Performance - After determining the amount of perceived stress experienced during the past two weeks, participants were asked to assess how these sources of stress have affected their "personal life" and their "job performance" during the same two (2) weeks. Responses were made on a Likert scale with categories recoded to range from zero (0) "Not at all" to four (4) "Extreme amount." These questions were used in the WRAIR studies mentioned earlier.

Coping - This variable was measured with a single question. The item read "During the past 2 weeks, how well have you coped with these stresses." The responses were recoded on a similar Likert scale with response categories ranging from zero (0) "Not at all" to four (4) "Extremely well." This measure was used in the WRAIR Gulf War studies.

Psychological Distress - Psychological distress is measured with a short form of the Center for Epidemiological Studies' Depression Scale (CES-D) [19, 20]. Based on an analysis by Mirowsky and Ross [20] of data from the 1992 National Science Foundation United States Survey of Work, Family, and Well-being, this index correlates 0.92 with the full CES-D and has an alpha reliability of 0.83. Like the full CES-D, participants in this study were asked, "How many days (0-7) during the past 7 days have you: Felt you just couldn't get going? ... Felt sad? ... Had trouble getting to sleep or staying asleep? ... Felt everything was an effort? ... Felt lonely? ... Felt you couldn't shake the blues? ... Had trouble keeping your mind on what you were doing?"

Responses were averaged to produce an index of distress scored from 0 to 7. The index score provides the number of "symptom-days" per week that a respondent reports being psychologically distressed. This scoring method has obvious appeal because it describes symptoms in a non-technical manner that is easy to understand in terms of what it means to be symptomatic "x" number of days in a week.

For the purposes of further analyses and comparison, scores were recoded following a form described by Kohout, et al.,. [21]: zero (0) - "rarely or none of the time as described by 0 days;" one (1) - "some of the time as described by 1 or 2 days;" two (2) - "much of the time as described by 3 or 4 days;" three (3) - "most or all of the time as described by 5-7 days. Recoded scores for these seven items range from zero (0) to twenty-one (21).

A score of 16 or higher on the 20 item version of the CES-D was originally validated with DSM-III criteria for clinical depression. While the CES-D does not indicate a diagnosis of clinical depression, the scale does discriminate between clinically depressed patients and others, and it is highly correlated with other established depression rating scales (Ross and Mirowsky, 1989). Following Shrout and Yager's [22] model for adjusting shortened versions of the CES-D to

establish a "depression cut point" equivalent to the conventional cutpoint score of 16 for the 20 item version, the current cutpoint is adjusted by multiplying scores by n/20. In this case 7/20*16 (for a cutpoint of 5.6). In the "health conditions" section of this questionnaire, participants were asked "Have you been unable to perform your military duties for 1 or more days because of emotional problems?" They were also asked "to report all conditions that you had during the past 30 days regardless of whether or not the condition resulted in a visit to sick call or a health care provider." "Psychological condition(s) or personal problem(s)" was one of these reportable conditions. Only 2 of the 16 men and 1 of the 24 women who answered positively to both questions had a CES-D score below 5.60. Of those who reported neither condition, 29.2% of the men and 34.0% of the women had CES-D scores of 5.60 or above. For women, this is as good as the false positive rate of 6.1% and false negative rate of 36.4% reported by Ensel [23, p. 66] for the 20 item version of the CES-D using a cut score of 16.

As used in this study, this modified 7-item scale has a high reliability (Cronbach coefficient alpha of 0.88 for the men and 0.87 for the women). A factor analysis using orthogonal rotation suggests that this scale represents one primary factor (depressed affect) that accounts for 58% of the overall scale variance.

Three points should be made regarding the use of this measure in this study. While there are many ways to measure distress, the CES-D scale has remained a respected measure of depressive symptomatology in large-scale surveys [23]. In addition, brief measurement devices like the short form of the CES-D used in this study are very important in studies where respondent burden is a factor [21]. Finally, as noted by Shrout and Yager [22], short versions of the CES-D are nearly as sensitive and as specific as the full 20 item version.

Quality of Life - Participants' perceived quality of life was measured using a seven (7) point Likert scale with recoded response categories ranging from minus three (-3) "Terrible" to plus three (+3) "Delighted." Zero (0) "Mixed" is treated as a mid-point for this measure. Five domains are considered: job, personal life, health and physical condition, family, and overall quality of life. A scale score ranging from -3 (terrible) to +3 (delighted) was created for each participant by dividing the individual's overall score by the number of items (5) in the scale. This resulted in approximately 10% of the current participants reporting an overall negative quality of life score. The Chronbach coefficient alpha for this 5-item measure is a very respectable 0.75 and a factor analysis using orthogonal rotation suggested that this scale represents one primary factor (overall personal quality of life) that accounts for 52% of the overall scale variance. Like the measure of psychological (depression) symptoms, each of these individual quality of life domains has unique descriptive value. While the CES-D measures distress and taps into biopsychosocial symptoms, the quality of life measure only examines life satisfaction-dissatisfaction or what might be considered an emotional aspect of psychological well-being [7].

RESULTS

Description of Study Participants

The larger study includes 4335 participants, 2167 women and 2141 men. The sex of 27 participants is unknown. As a concession to an enormous data collection requirement and corresponding concern about participant burden, only two of the four versions of the randomly assigned survey instruments contain the psychosocial questions used in the current data analysis. Data are available for 2114 participants or 48.7% of the total study population (1039 men, 1064 women, and 11 participants whose gender is unknown). Comparisons in Table 1 suggest that there are only slight differences in the participants completing the versions of the questionnaire that contain psychosocial questions and versions without these items.

Table 1. Demographic Information, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

AGE	**STANDARD**		**PSYCHOSOCIAL**	
	Male	**Female**	**Male**	**Female**
	N=1102	N=1103	N=1039	N=1064
Mean	26.323	25.821	26.628	26.259
Standard Deviation	6.289	5.968	6.367	6.134
RACE - ETHNIC STATUS				
White, non-Hispanic	55.0%	50.0%	52.0%	49.8%
White, Hispanic	5.2%	6.3%	5.4%	5.5%
Black/African-American, non-Hispanic	26.5%	30.3%	29.6%	30.5%
Black/African-American, Hispanic	1.5%	2.0%	1.5%	2.8%
Asian/Pacific Islander	4.7%	3.7%	4.0%	3.9%
Native American	1.5%	1.7%	1.3%	1.2%
Other Race/Ethnicity	5.0%	4.7%	5.4%	5.0%
RANK				
E1-E3	27.9%	33.5%	30.4%	30.9%
E4-E6	60.5%	56.0%	58.5%	58.6%
E7-E9	4.8%	4.1%	5.6%	4.3%
All Officers/Warrant Officers	5.1%	4.8%	3.4%	4.2%
EDUCATION				
Some high school	1.2%	0.7%	2.1%	0.4%
High school graduate or GED	59.7%	51.5%	62.5%	50.8%
Trade or technical school graduate	5.5%	3.4%	4.2%	3.1%
Some college or AA degree	26.5%	36.4%	25.9%	37.6%
College degree and above	7.1%	7.7%	5.1%	8.0%

AGE	STANDARD		PSYCHOSOCIAL	
	Male	Female	Male	Female
	N=1102	N=1103	N=1039	N=1064
MARITAL STATUS				
Never married	39.7%	48.8%	40.4%	48.8%
Married	52.8%	34.7%	50.8%	35.0%
Separated	2.9%	7.8%	4.0%	6.3%
Divorced	4.4%	8.4%	4.6%	9.4%
Widowed	0.0%	0.2%	0.0%	0.3%
SHIPBOARD STATUS				
In home port	84.5%	84.3%	86.1%	84.1%
At sea	10.3%	9.6%	9.3%	8.9%
In port other than home port	1.5%	1.0%	1.0%	1.8%
In shipyard	1.6%	2.3%	1.6%	2.3%
Other	1.0%	2.0%	1.4%	1.7%

Table 1 provides a general description of the 2114 participants who responded to psychosocial questions. The mean age for men and women is approximately 26 years. Most participants list themselves as either "White, non-Hispanic" (52.0% men versus 49.8% women) or "Black/African-American, non-Hispanic" (29.6% men versus 30.5% women). Other minorities make up smaller segments of the sample. The vast majority of the participants are enlisted personnel (96.6% men versus 95.8% women) primarily in the grade of E1-E3 (30.4% men versus 30.9% women) and E4-E6 (58.5% men versus 58.6% women). Almost all participants are high school graduates (97.9% men versus 99.6% women). Approximately 4.2% of the men and 3.1% of the women are trade or technical school graduates. Men and women in this sample do differ substantially in the percentages who have attended and completed college. Only 31.0% of the men versus 45.6% of the women have attended college and 5.1% of the men versus 8.0% of the women have a college degree.

There are obvious differences in the marital status of these men and women. Overall, a higher percentage of the men are currently married (50.8%) as compared to the women (35.0%). This difference is smallest in the junior grades (20.6% of the E1-E3 men and 18.6% of the women) and most pronounced in the more senior grades (62.8% of the E4-E6 men versus 41.0% of the women, 81.0% of the E7-E9 men versus 56.5% of the women, and 68.6% of the officer men versus 48.9% of the women. The junior enlisted rank group is also different from the senior rank groups in the number of men and women who report being divorced or separated from their spouse. In the E1-E3 rank group 12% of the men versus 5.2% of the women are divorced or separated. Among the more senior rank groups the percentages are just the opposite: 11.2% of the E4-E6 men versus 20.8% of the women are divorced or separated, 13.8% of the E7-E9 men

and 26.1% of the women are divorced or separated, and in the Officer/Warrant Officer group 11.2% of the men versus 17.8% of the women are divorced or separated.

At the time these data were collected 86.1% of the men and 84.1% of the women were in home port. Approximately 9% of men and women were at sea. The remaining 5% of the participants were evenly divided between a port other than home, in a shipyard, or some other location.

Men and women in this sample have been successfully matched on a number of demographic variables. Important differences exist within and across rank groups, for example: age; education; income; marital status; and shipboard experiences. Because military rank is such a powerful stand-in variable for a variety of sociodemographic variables, this study has made use of separate rank comparisons in the analysis of similarities and differences between men and women. This approach also helps to solve the problem that the distribution of participants in these data is not representative of men and women assigned to shipboard status. It is important to note that in these data, mid-level enlisted categories are over represented among the participants.

Life Stress Conditions and Associated Current Overall Life Stress

Participants were asked about a variety of issues (32 items) that might be sources of current overall life stress. The current analysis focuses on 18 issues related to stress from aspects of shipboard duty and living conditions, duty (work place) relationships, military career and promotion issues, personal finances and personal-family relationships. Prior to answering questions about how much of their perceived stress comes from problems or concerns within each of these specific domains, participants were asked to assess "On the whole, how much stress do you think is in your life right now?" Possible scores ranged from (0) "None at all" to (4) "Extreme amount." Table 2 highlights comparisons of perceived overall current life stress by gender and rank groups.

Table 2. Overall Life Stress for Navy Men and Women, Percentage by Category, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

Think about your life over the **past 2 weeks**. *On the whole, how much stress do you think is in your life right now ?*								
	NONE AT ALL	A LITTLE BIT	MODERATE AMOUNT	QUITE A BIT	EXTREME AMOUNT	MEAN	STANDARD DEVIATION	T-SCORE
E1-E3 Rank Groups								
Men n = 308	6.2%	23.7%	24.0%	27.3%	18.8%	2.289	1.196	-0.72
Women n = 322	3.1%	20.5%	30.1%	30.4%	15.8%	2.354	1.07	
E4-E6 Rank Groups								
Men n = 585	6.0%	21.0%	32.3%	29.1%	11.6%	2.193	1.082	-2.15*
Women n = 611	3.1%	21.3%	29.5%	32.2%	13.9%	2.326	1.054	

Think about your life over the **past 2 weeks**. *On the whole, how much stress do you think is in your life right now ?*								
	NONE AT ALL	A LITTLE BIT	MODERATE AMOUNT	QUITE A BIT	EXTREME AMOUNT	MEAN	STANDARD DEVIATION	T-SCORE
E7-E9 Rank Groups								
Men n = 57	1.8%	15.8%	28.1%	38.6%	15.8%	2.509	1.002	0.73
Women n = 44	0.0%	27.3%	15.9%	50.0%	6.8%	2.364	0.967	
All Officers/Warrant Officers								
Men n = 34	5.9%	14.7%	26.5%	32.4%	20.6%	2.471	1.161	-0.29
Women n = 45	0.0%	8.9%	35.6%	48.9%	6.7%	2.533	0.757	

*P < 0.03

There are 732 men (*70.5%*) and 793 women (*74.5%*) who reported a moderate-to-extreme amount of stress in their life during the past two weeks. There are no differences between men and women within the overall group. Within the four rank groups, the E4-E6 women have higher stress scores than the comparison group of men. The Mean score for each of the 8 Gender/Rank groups is in the "moderate amount" range of the current overall stress range (from a low of 2.19 for E4-E6 men to a high of 2.53 for women Officers/Warrant Officers). Despite having the highest overall mean scores, the women Officers/Warrant Officers and the E7-E9 women typically endorse the "Moderate amount" and "Quite a bit" stress categories. Substantially fewer of these women report "Extreme amounts" of stress as compared to men (6.7% of the women versus 20.6% of the men for the Officer/Warrant Officers and 6.8% versus 15.8% for the E7-E9 rank group). While they may perceive themselves to be under a substantial amount of current overall life stress, these senior women may be under reporting the actual intensity of this stress.

Tables 3a-c are focused on those participants who report that they are currently experiencing a "moderate amount, quite a bit, or an extreme amount" of stress in their overall current life (70.5% of the men and 74.5% of the women). Based on participants' perception that there is stress in their current life, the analysis looks at the relationship between this stress and a variety of life stress factors or "conditions" that are reported by participants as sources of this overall stress. Tables 3a-c present data from 3 groupings of 18 individual life stress conditions. Except for personal finances, these life stress conditions are directly associated with shipboard status, duty relationships, and other military career and life issues.

Shipboard Living Conditions: Table 3a compares the stressed men and women (those who reported experiencing moderate to extreme levels of overall life stress) across rank groups on 8 aspects of shipboard living conditions. "Crowed conditions aboard ship" are a source of moderate-to-extreme stress for 54.0% of the men and 51.2% of the women. "Lack of privacy" was reported a source of moderate-to-extreme stress for 48.3% of the men and 52.1% of the women. "The people I share living space aboard ship" was a source of moderate-to-extreme stress for 31.5% of the men versus 38.7% of the women (this represents a significant difference, Chi-sq

=11.85, df = 4, p < 0.018). "Personal safety aboard ship" was a source of moderate-to-extreme stress for 26.5% of the men and 27.3% of the women. "Being able to maintain personal hygiene" was a source of moderate-to-extreme stress for 28.1% of the men and 28.0% of the women. For men and women who report that they are experiencing a high level of current overall life stress, a quarter to a half of these individuals (regardless of gender) perceive these specific aspects of shipboard living conditions as highly stressful. "Nutrition concerns and the unavailability of desired foods aboard ship" was a source of moderate-to-extreme stress for 51.5% of the men and 55.1% of the women. "The lack of recreational activities aboard ship" was a moderate-to-extreme source of stress for 32.6% of the men and 33.7% of the women. "Inability to get enough exercise" was a moderate-to-extreme source of stress for 28.8% of the high stress men and 33.2% of the high stress women.

All of these aspects of shipboard life were perceived as stressful for a quarter to a half of the stressed participants. As an overall group, generally, men and women do not differ on their assessment of these sources of stress. On only one of the eight shipboard living conditions, the amount of stress associated with "the people I share living space aboard ship," is there a significant difference between men and women with a higher percentage of women reporting the experience of moderate-to-extreme stress.

There are some interesting differences between men and women within different rank groups, especially among the percentage that endorse the "extreme amount" of stress category. Among the E1-E3 rank group, 21.8% of the men versus 28.0% of the women report an extreme amount of stress associated with "crowded conditions aboard ship" and 21.8% of the men versus 31.7% of the women report "lack of privacy aboard ship" as an extreme source of stress. While almost 20% of the men and women in the E4-E6 rank group have the same complaints, women are only slightly more likely to view these conditions as a sources of extreme amounts of stress. Generally, E7-E9 and Officers/Warrant Officers do not report these areas as sources of extreme stress. The one exception is the Officer/Warrant Officer category where 18.5% of the men versus 0.0% (zero) percent of the women reporting "quite a bit" of stress associated with crowded conditions aboard ship. A total of 14.9% of the E7-E9 men and 9.4% of the women report crowed conditions as either "quite a bit" or an "extreme amount" of stress.

Duty Issues: Table 3b focuses on 5 duty relationships and work place issues. Gender comparisons are reported for those who said that they are currently experiencing "moderate to extreme" levels of stress in their life right now. "The way things are typically done aboard ship" was seen as a moderate to extreme source of stress for 74.2% of these stressed men and 72.3% of the women. Stress associated with "the person I work for, my immediate supervisor" was a moderate-to-extreme for 43.3% of the men versus 45.6% of the women. "The people I work with, my peers" was reported as a source of moderate-to-extreme stress for 41.2% of the stressed men versus 45.4% of the women (Chi-sq = 12.99, df = 4, p < 0.011). "My ability to perform my duties" was a source of moderate-to-extreme stress for 19.0% of the men versus 27.4% of the women (Chi-sq = 19.52, df = 4, p < 0.001).

PRELIMINARY REPORT

Table 3a. Life Stress Conditions for Navy Men and Women (for individuals reporting moderate to extreme overall life stress), Percentage by Category, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

Of the stress that you experience, how much of it comes from problems or concerns with:									(N=732 Men ; N=793 Women)
SHIPBOARD LIVING CONDITIONS:		**NONE AT ALL**	**A LITTLE BIT**	**MODERATE AMOUNT**	**QUITE A BIT**	**EXTREME AMOUNT**	**MEAN**	**STANDARD DEVIATION**	**t-SCORE**
crowded conditions aboard ship	Men	26.8%	19.2%	20.0%	14.7%	19.3%	1.60	1.47	-1.18
	Women	29.0%	19.7%	14.8%	14.8%	21.6%	1.68	1.51	
lack of privacy aboard ship	Men	32.7%	19.1%	16.8%	14.0%	17.5%	1.49	1.49	-3.47**
	Women	29.6%	18.2%	14.9%	13.9%	23.3%	1.72	1.54	
people with whom I share living space aboard ship	Men	41.9%	26.6%	14.8%	8.7%	8.0%	1.01	1.24	-3.85**
	Women	38.3%	23.0%	16.1%	9.9%	12.7%	1.23	1.37	
my personal safety aboard ship	Men	48.7%	24.8%	14.8%	6.2%	5.5%	0.85	1.15	-1.21
	Women	47.6%	25.2%	14.5%	6.4%	6.4%	0.91	1.17	
maintaining personal hygiene aboard ship	Men	53.1%	18.8%	13.6%	7.9%	6.6%	0.89	1.25	-0.59
	Women	53.5%	18.5%	11.9%	8.8%	7.3%	0.92	1.27	
the lack of recreational activities aboard ship	Men	47.2%	20.2%	14.1%	9.5%	9.0%	1.00	1.31	-0.54
	Women	47.7%	18.6%	14.1%	9.8%	9.8%	1.04	1.33	
my nutrition, the unavailability of desired foods aboard ship	Men	29.0%	19.7%	16.3%	16.6%	18.6%	1.56	1.49	-3.15*
	Women	27.1%	17.8%	14.8%	18.3%	22.0%	1.77	1.52	
my inability to get enough exercise aboard ship	Men	50.3%	20.9%	12.7%	8.8%	7.3%	0.89	1.24	-2.26
	Women	47.6%	19.2%	14.3%	9.1%	9.8%	1.02	1.31	

* $p < 0.01$, ** $p < 0.001$

Table 3b. Life Stress Conditions for Navy Men and Women (for individuals reporting moderate to extreme overall life stress), Percentage by Category, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

Of the stress that you experience, how much of it comes from problems or concerns with:									N=721 Men; N=782 Women
DUTY RELATIONSHIPS AND SHIPBOARD OPERATIONS		**NONE AT ALL**	**A LITTLE BIT**	**MODERATE AMOUNT**	**QUITE A BIT**	**EXTREME AMOUNT**	**MEAN**	**STANDARD DEVIATION**	**t-SCORE**
the people I work with (my peers)	Men	32.1%	26.7%	21.1%	11.8%	8.3%	1.16	1.24	-3.41**
	Women	26.0%	28.6%	22.0%	10.6%	12.8%	1.35	1.29	
the people who work for me (those I supervise)	Men	50.5%	21.6%	14.4%	6.7%	6.8%	0.83	1.17	1.73
	Women	57.7%	17.2%	12.4%	6.9%	5.8%	0.74	1.15	

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PRELIMINARY REPORT

Of the stress that you experience, how much of it comes from problems or concerns with:									N=721 Men; N=782 Women
DUTY RELATIONSHIPS AND SHIPBOARD OPERATIONS		NONE AT ALL	A LITTLE BIT	MODERATE AMOUNT	QUITE A BIT	EXTREME AMOUNT	MEAN	STANDARD DEVIATION	t-SCORE
the person I work for (my immediate supervisor)	Men Women	36.9% 33.0%	19.8% 21.5%	14.8% 16.5%	11.0% 10.4%	17.5% 18.7%	1.3 1.38	1.46 1.45	-1.21
my ability to perform my duties	Men Women	56.9% 51.2%	24.1% 21.4%	11.5% 16.3%	5.7% 6.3%	1.8% 4.8%	0.6 0.77	0.96 1.1	-3.63**
the way things are typically done aboard ship	Men Women	10.8% 11.4%	17.0% 16.4%	21.0% 22.2%	20.2% 18.7%	31.0% 31.4%	2.11 2.24	1.47 1.14	-2.04

* p< 0.01, ** p< 0.001

Table 3c. Life Stress Conditions for Navy Men and Women (for individuals reporting moderate to extreme overall life stress), Percentage by Category, U.S. Navy Women Aboard Ship Study - 15 NOV 1994 - 31 JAN 1996

Of the stress that you experience, how much of it comes from problems or concerns with:									N=721 Men; N=782 Women
CAREER AND PERSONAL ISSUES		NONE AT ALL	A LITTLE BIT	MODERATE AMOUNT	QUITE A BIT	EXTREME AMOUNT	MEAN	STANDARD DEVIATION	t-SCORE
financial matters	Men Women	13.9% 16.7%	27.1% 28.6%	25.0% 21.8%	19.4% 19.3%	14.6% 13.6%	1.73 1.66	1.28 1.28	1.23
my career and chances for promotion	Men Women	25.8% 28.4%	20.6% 19.7%	20.7% 18.8%	14.2% 15.0%	18.6% 18.1%	1.6 1.57	1.43 1.45	0.48
being able to stay in the Navy because of downsizing or force reductions	Men Women	58.8% 63.0%	17.7% 14.2%	10.2% 9.7%	6.8% 6.0%	6.6% 7.2%	0.76 0.72	1.2 1.21	0.78
my relationship with my spouse or boyfriend/girlfriend	Men Women	45.5% 46.2%	18.5% 17.6%	15.9% 14.5%	9.1% 10.4%	10.9% 11.3%	1.03 1.05	1.33 1.34	-0.3
my ability to communicate with my family and friends	Men Women	45.7% 45.7%	27.9% 26.0%	15.8% 13.6%	7.0% 8.6%	3.6% 6.1%	0.81 0.89	1.08 1.16	-1.6

* p< 0.01, ** p< 0.001

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Stress related to "the people who work for me" was described as a source of moderate-to-extreme stress for 28.3% of the E4-E6 men versus 30.6% of the women. The more senior men and women had even higher percentages reporting moderate to extreme stress for this question (56.5% of the E7-E9 men versus 47.0% of the women, and 55.5% of the Officer/Women men versus 48.9% of the women.

This stressed group clearly perceives the shipboard duty (workplace) environment as a substantial source of current stress. In the junior rank groups, women have the higher percentage reporting stress. In the senior rank groups, men report higher stress scores. Approximately one-half of the most senior men and women report supervisor and peer relationships as important sources of stress, and those in supervisory positions report that those they supervise are a source of a substantial amount of stress. Almost one-third of the women express concern about their ability to perform their duties as an important source of stress. One-fifth of the men share this concern.

The issue of "the way things are typically done aboard ship" is a substantial concern across all rank groups and there are no real gender differences within rank group comparisons. This condition is reported as a source of an "extreme amount" of stress for as many as 33.3% of the men in the Officer/Warrant Officer category to 21.9% of the E7-E9 women.

Career and Personal Life Issues: Table 3c summarizes the importance of 5 career and personal life stress conditions for those participants reporting overall stress in their current life. "Personal finances" are reported as a moderate-to-extreme source of stress for 59.0% of the men and 54.7% of the women. Concern about "career and chances of promotion" are reported to be sources of moderate-to-extreme stress for 53.5% of the men and 51.9% of the women. "My relationship with my spouse or boyfriend/girlfriend while aboard ship" is a source of moderate-to-extreme stress for 35.9% of the men and 36.2% of the women. "My ability to communicate with my family and friends while aboard ship" is a source of moderate-to-extreme stress for 26.4% of the men and 28.3% of the women. "Downsizing concerns" are moderate-to-extreme sources of stress for 23.6% of the men and 22.9% of the women.

As in many of the previous shipboard life stress issues, each of these military career and personal life issues represent substantial sources of stress for both the men and women in this stressed subgroup. As in the shipboard living conditions, these career and personal life issues do not suggest substantial gender differences. Overall, women typically experience these stresses in the same way, or at least to the same magnitude as men.

"Financial matters" and "my career and chances for promotion" are the source of substantial stress for enlisted personnel, especially the E1-E3 and E4-E6 rank groups with more than 50% of both men and women reporting these as sources of "moderate to extreme amounts of stress." The other notable rank group differences include 60% of the E7-E9 men versus 41% of the women reporting "financial matters" as a source of "moderate to extreme amounts of

stress" and 14.8% of the men in the Officer/Warrant Officer group versus zero percent of the women reporting "an extreme amount" of stress associated with "my relationship with my spouse or girlfriend/boyfriend."

The Relationship of Life Stress Conditions To Overall Current Life Stress: Tables 4 and 5 summarize important aspects of the relationship between these 18 current life stress conditions and current overall life stress. This analysis is focused on all study participants, including those who reported "none at all" or "a little bit" of overall life stress. While the variables used in this analysis do not posses all of the technical properties of interval level variables, a cautious use of regression analysis provides a reasonable way to present the apparent relationship of these life stress conditions to the overall measure of current life stress [24, 25]. Introducing such a large number of variables would be undesirable if this analysis was focused on model building. Here the goal is limited to identifying the most important variables related to current overall stress. This makes it important not to exclude potentially relevant independent variables [26, p.346].

A step-wise, hierarchical regression approach was employed to control for three sets of variables thought to influence the dependent variable: participant's age and racial-ethnic status on the first step, and rank group and marital status on the second step. All 18 of the life stress conditions were entered in a stepwise analysis on the third step. For simplicity in presentation a gender comparison, a separate analysis was performed for men and women. Tables 4 and 5 provides the adjusted R^2 and the R^2 change as indication of the relative importance of these 18 independent variables when considered together as predictors of overall current life stress.

Table 4. Stepwise, Hierarchical Multiple Regression: Life Stress Conditions As Predictors of Overall Life Stress - *Men (N = 897),* U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

PREDICTOR	**R**	**R^2**	**R^2 CHANGE**	*t*	*p*
Race/Ethnic Group Age	0.09	0.007	0.007	-2.141 -2.011	0.033 0.045
Marital Status Rank Group	0.14	0.020	0.013	2.023 2.165	0.043 0.031
The way things are done aboard ship	0.45	0.201	0.181	8.271	0.000
My relationship with spouse/friend	0.49	0.240	0.039	4.186	0.000
The person I work for	0.51	0.263	0.023	3.372	0.001
Financial matters	0.53	0.277	0.014	3.933	0.000
Ability to communicate to family/friends	0.54	0.286	0.009	2.965	0.003
The people I work with	0.54	0.291	0.005	2.511	0.012
CONSTANT				8.103	0.000

$F = 36.432$, $DF = 10/886$, $p < 0.000$

Table 5. Stepwise, Hierarchical Multiple Regression: Life Stress Conditions As Predictors Of Overall Life Stress, *Women (N = 916)*, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

PREDICTOR	R	R^2	R^2 CHANGE	*t*	*p*
Race/Ethnic Group Age	0.022	0.001	0.001	-1.537 0.115	0.125 0.909
Marital Status Rank group	0.038	0.001	0.001	-1.27 2.267	0.205 0.024
People I work with	0.375	0.140	0.139	4.113	0.000
Financial Matters	0.455	0.207	0.067	6.035	0.000
My ability to perform my duties	0.500	0.250	0.043	4.396	0.000
My relationship with spouse/friend	0.526	0.276	0.026	4.963	0.000
The person I work for	0.543	0.295	0.019	4.419	0.000
The way things are done aboard ship	0.555	0.308	0.013	3.856	0.000
Maintaining personal hygiene aboard ship	0.561	0.315	0.007	-3.504	0.001
The people I share ship living space with	0.565	0.319	0.004	2.156	0.031
Ability to communicate to family/friends	0.568	0.322	0.003	2.047	0.041
CONSTANT				8.401	0.000

F = 33.05, DF = 13/903, p< 0.000

As noted in Tables 4 and 5, demographic characteristics, including rank groups, do not make important contributions to our understanding of the relationship between life stress conditions and overall current life stress. There are some differences between men and women regarding the relationship between life stress condition and overall life stress. The way things are typically done abroad ship is the most influential variable for men (R2 change = 0.181). Women endorse "the people I work with" as the most influential stress variable (R2 change = 0.139). "My inability to maintain personal hygiene aboard ship" and "the people I share living space with aboard ship" are significant but somewhat less important sources of life stress for women. They are not significant sources of stress for men. Both men and women endorse financial matters as a source of stress.

The Impact of Life Stress on Perceived Personal Life, Job Performance and Coping

Participants were asked to comment on the degree to which these life stress conditions "have affected" them during the past 2 weeks. This assessment was made regarding the effect on "personal life" and "performance in my job." In addition, participants were asked "during the past 2 weeks, how well have you coped with this stress?"

Tables 6 and 7 provide data from the entire sample broken down by rank groups. In this case, 36.4% of the participants said that these life stress conditions had a moderate-to-extreme

effect on their military job performance. A much smaller percentage (7.3%) said that these life stress conditions had a moderate-to-extreme effect on their personnel life. When asked to comment on "how well have you coped with these stresses," only 7.3% of the stressed participants said that they were "not (coping) at all." Another 16.5% described themselves as coping "a little bit." The remaining 76.2% reported that they were coping "moderately well, quite a bit, or extremely well." "Coping" was the only one of these three variables with a significant overall difference between men and women ($t = 2.00$, $p < 0.026$).

Table 6a. The Effects of Overall Life Stress on Duty (Job) Performance for Navy Men and Women Participants Reporting Moderate to Extreme Overall Life Stress, Percent by Category U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

During the past 2 weeks, the stresses listed above have affected my performance in my job								
	NONE AT ALL	A LITTLE BIT	MODERATE AMOUNT	QUITE A BIT	EXTREME AMOUNT	MEAN	STANDARD DEVIATION	t-SCORE
E1-E3 Rank Groups								
Men n=212	30.2%	25.0%	18.4%	17.9%	8.5%	1.495	1.315	0.45
Women n=240	27.9%	27.9%	23.3%	13.8%	7.1%	1.442	1.229	
E4-E6 Rank Groups								
Men n=421	34.4%	27.1%	21.4%	10.9%	6.2%	1.273	1.217	-0.82
Women n=455	28.8%	34.1%	18.7%	11.2%	7.3%	1.341	1.21	
E7-E9 Rank Groups								
Men n=46	17.4%	43.5%	19.6%	13.0%	6.5%	1.478	1.13	1.18
Women n=32	25.0%	40.6%	28.1%	3.1%	3.1%	1.188	0.965	
All Officers/Warrant Officers								
Men n=27	44.4%	37.0%	11.1%	7.4%	0.0%	0.815	0.921	-0.7
Women n=40	35.0%	40.0%	17.5%	7.5%	0.0%	0.975	0.92	

Table 6b. The Effects of Overall Life Stress on Personal Life Performance for Navy Men and Women Participants Reporting Moderate to Extreme Overall Life Stress, Percentage by Category, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

During the last 2 weeks, the stresses above have affected my personal life								
	NONE AT ALL	A LITTLE BIT	MODERATE AMOUNT	QUITE A BIT	EXTREME AMOUNT	MEAN	STANDARD DEVIATION	t-SCORE
E1-E3 Rank Groups								
Men n=212	17.0%	24.1%	26.4%	21.2%	11.3%	1.858	1.254	0.17
Women n=242	14.9%	30.6%	24.0%	16.9%	13.6%	1.839	1.263	

During the last 2 weeks, the stresses above have affected my personal life								
	NONE AT ALL	A LITTLE BIT	MODERATE AMOUNT	QUITE A BIT	EXTREME AMOUNT	MEAN	STANDARD DEVIATION	t-SCORE
E4-E6 Rank Groups								
Men n=423	18.7%	31.9%	27.2%	14.4%	7.8%	1.608	1.171	-2.33*
Women n=458	12.9%	33.8%	24.7%	18.3%	10.3%	1.793	1.186	
E7-E9 Rank Groups								
Men n=46	10.9%	41.3%	28.3%	17.4%	2.2%	1.587	0.979	1.13
Women n=32	15.6%	43.8%	31.3%	9.4%	0.0%	1.344	0.865	
All Officers/Warrant Officers								
Men n=27	25.9%	33.3%	18.5%	7.4%	14.8%	1.519	1.369	0.54
Women n=39	23.1%	33.3%	28.2%	15.4%	0.0%	1.359	1.013	

*p< 0.05

Table 7. The Effects of Overall Life Stress on Coping for Navy Men and Women Percentage of Participants Reporting Moderate to Extreme Overall Life Stress, U.S. Navy Women aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

During the past 2 weeks, how well have you coped with these stresses?								
	NOT AT ALL	A LITTLE BIT	MODERATELY WELL	QUITE A BIT	EXTREMELY WELL	MEAN	STANDARD DEVIATION	t-SCORE
E1-E3 Rank Groups								
Men n=210	6.2%	25.2%	35.2%	17.6%	15.7%	2.11	1.139	1.04
Women n=243	7.4%	24.3%	42.8%	11.5%	14.0%	2	1.104	
E4-E6 Rank Groups								
Men n=421	4.0%	11.4%	44.4%	18.1%	22.1%	2.43	1.077	2.00*
Women n=454	4.4%	15.0%	47.8%	13.7%	19.2%	2.28	1.073	
E7-E9 Rank Groups								
Men n=45	0.0%	13.3%	46.7%	22.2%	17.8%	2.44	0.943	-2.31*
Women n=32	0.0%	9.4%	25.0%	25.0%	40.6%	2.97	1.031	
All Officers/Warrant Officer								
Men n=27	0.0%	0.0%	29.6%	18.5%	51.9%	3.22	0.892	1.33
Women n=40	2.5%	10.0%	25.0%	22.5%	40.0%	2.88	1.137	

* p < 0.05

Among the enlisted personnel, E1-E3 men and women reported the largest effect on perceived job performance (44.8% and 44.2% experiencing moderate-to-extreme effects). The E4-E6 and the E7-E9 men and women also had relatively high percentages in the moderate to extreme stress categories. (39.1% to 34.5%). More E7-E9 men than women reported "quite a bit to an extreme amount of stress affecting their job performance" (19.2% versus 6.2%).

Based on these data, E4-E6 women have significantly worse personal life performance scores than men ($t = -2.33$, $p < 0.020$) and men have better coping scores ($t = 2.00$, $p < 0.04$). The E7-E9 men have worse coping scores than women ($t = -2.31$, $p < 0.023$). All other rank/gender comparisons are not significantly different.

E1-E3 men reported the greatest effects of these life stress conditions on their perceived "personal life" performance (59.0% experiencing moderate-to-extreme effects). E7-E9 women reported the lowest effect (40.6% experiencing moderate-to-extreme effects). Among the officers, 47.8% of the men and 43.6% of the women reported moderate-to-extreme effects on their personnel life. The group with the highest percentage reporting that they have not been able to cope "at all" with these stresses was the E4-E6 men (7.4%). All of the E7-E9 men and women said that they were able to cope at least "a little bit." Officers/warrant officers also reported that they were generally able to cope with these current life stresses. All of the men reported that they were able to cope at least "a little bit" and only 2.5% of the women in this rank group reported that they were not able to cope "at all."

The Relationship Between Overall Stress, Performance and Coping: Based on an analysis of data from the entire sample, there are strong positive relationships between the perception of overall current life stress and perceptions of duty performance ($r = 0.44$, $n = 2017$, $p < 0.000$) and personal life performance ($r = 0.55$, $n = 2025$, $p < 0.000$). There is a much smaller negative relationship between stress and coping ($r = -0.18$, $n = 2015$, $p < 0.000$). There are no gender or rank differences in these relationships. There are no gender or rank differences in the relationships between job performance and coping ($r = -0.21$, $n = 2025$, $p < 0.000$) or personal life performance and coping ($r = -0.23$, $n = 2034$, $p < 0.000$). The strong relationship between job performance and personal life performance ($r = 0.55$, $n = 2040$, $p < 0.000$) is not influenced by gender or rank. In all cases the partial correlations, controlling for gender or rank, are almost identical to or just slightly less than these bivariate correlations.

Assessment of Current Psychological Distress

Distress Scale: The modified CES-D scale uses a cutpoint of greater than 5.60 as the criteria for the presence of current emotional distress symptoms. The junior enlisted men and junior enlisted women have overall mean scores above this cutpoint. These scores are significantly higher than all the other rank groups. Overall, the more senior the group the less the group's distress score. This is true for both men and women participants. As a group, 35.4% of the sample report scores above the distress cutpoint (45.5% for the E1-E3 rank group, 31.9%

for the E4-E6 group, 29.3% for the E7-E9 group, and 20.8% for the Officers/Warrant Officers. Women's overall scores are higher than men's ($t = -3.16$, $p < 0.002$). The greatest difference between the rank groups is the difference between E4-E6 men and women ($t = -3.38$, $p < 0.001$). It is clear from these scores that a substantial number of study participants, especially the junior enlisted men and women report considerable current psychological distress.

Symptom Days: Another way to consider the prevalence of current psychological distress is to look at the percentage of all participants who report that they are experiencing specific distress symptoms 5 to 7 days per week. These individuals represent the most symptomatic group. Table 8 provides a straightforward way to understand the magnitude of these symptoms across the gender and rank groups. A slightly larger percentage of women report extreme symptoms. Overall, 18% to 10% of participants report experiencing extreme distress across the seven specific distress symptoms.

The Relationship Between CES-D and Overall Life Stress, Perceived Stress Effects On Job Performance, Perceived Stress Effects On Personnel Life Performance, And Coping: The modified CES-D measure is positively correlated with the measure of overall current stress ($r = 0.52$, $N = 1981$, $p < 0.000$). It is positively correlated with perceived stress effects on job performance ($r = 0.49$, $N = 1961$, $p < 0.000$) and with perceived stress effects on personal life performance ($r = 0.56$, $N = 1918$, $p < 0.000$). Participants' perception of how well they have coped with these stresses over the past two weeks is negatively correlated with the modified CES-D measure ($r = -0.28$, $N = 1957$, $p < -0.000$). The only substantial difference between men and women relates to the coping variable. There is a substantially higher correlation between coping and the CES-D measure for women (women: $r = -0.34$, $N = 978$, $p < 0.000$; men: $r = -0.23$, $N = 970$, $p < 0.000$).

Table 8. DISTRESS (CESD): Navy Men/Women Reporting Severe Symptoms, Percent by Category, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

SYMPTOMS: Most or all of the time (5 TO 7 DAYS)	**TOTAL N = 1017 (men) N = 1084 (women)**	**E1-E3 n= 316 (men) n= 308 (women)**	**E4-E6 n = 608 (men) n = 667 (women)**	**E7-E9 n = 58 (men) n = 53 (women)**	**Officer/WO n= 35 (men) n= 56 (women)**
Lonely	16.4% 18.3%	24.3% 24.1%	13.9% 16.7%	7.0% 11.4%	8.8% 9.3%
Trouble Sleeping	14.7% 16.4%	18.3% 17.1%	13.4% 16.7%	14.0% 13.6%	5.9% 11.1%
Sad	11.1% 16.1%	16.6% 24.0%	8.6% 13.4%	8.9% 2.3%	11.8% 11.1%
Trouble Keeping Mind on Things	13.3% 15.3%	20.1% 21.8%	10.9% 13.4%	8.8% 2.3%	2.9% 6.7%
Everything an Effort	13.5% 15.4%	18.3% 21.7%	11.9% 13.4%	7.1% 2.3%	11.8% 8.9%

SYMPTOMS: Most or all of the time (5 TO 7 DAYS)	TOTAL N = 1017 (men) N = 1084 (women)	E1-E3 n= 316 (men) n= 308 (women)	E4-E6 n = 608 (men) n = 667 (women)	E7-E9 n = 58 (men) n = 53 (women)	Officer/WO n= 35 (men) n= 56 (women)
Couldn't Shake the Blues	10.3% 14.3%	16.3% 19.9%	8.0% 12.1%	5.3% 6.8%	5.9% 11.1%
Couldn't Get Going	10.9% 12.6%	15.0% 16.8%	9.6% 11.5%	3.6% 4.7%	11.8% 4.4%

Life Stress Conditions Associated With Stress Aboard Ship That Predict Psychological Distress (CES-D): Tables 9 and 10 compare the effects associated with the stress of being aboard ship, overall life stress, and coping on psychological distress for men and women. For the purpose of this analysis, a single stress item associated with being aboard ship is used in the regression analysis. This single item measure is highly correlated with all the individual aboard ship life stress conditions. A separate analysis was done for men and women. After controlling for the effects of age and race, rank group and marital status, the stress related to being aboard ship makes an important contribution to the overall explanation of distress (R2 change of 0.13 and 0.12). The overall stress variable remains an important contributor in explaining distress for both men and women (R2 change of 0.18 and 0.19). When these stress related variables are considered, coping has a small effect on the explanation of distress for men and women (R2 change 0.03 and 0.02).

Table 9. Stepwise, Hierarchical Multiple Regression: Correlates of CESD Men Participants, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	DF	R	ADJUSTED R_2	R^2 CHANGE	F	p
Race & Age	2/906	0.17	0.03	0.03	13.40	0000
Marital Status & Rank	4/904	0.21	0.05	0.02	10.76	0000
Stress of being aboard ship	5/903	0.42	0.18	0.13	38.74	0000
Current overall life stress	6/902	0.61	0.36	0.18	87.92	0000
Current perceived coping	7/901	0.63	0.39	0.03	82.62	0000

Table 10. Stepwise, Hierarchical Multiple Regression: Correlates of CESD Women Participants, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	DF	R	ADJUSTED R_2	R^2 CHANGE	F	p
Race & Age	2/933	0.12	0.01	0.01	6.72	0013
Marital Status & Rank	4/931	0.17	0.02	0.01	6.73	0000
Stress of being aboard ship	5/930	0.39	0.15	0.12	33.69	0000
Current overall life stress	6/929	0.58	0.34	0.19	80.08	0000
Current perceived coping	7/928	0.60	0.36	0.02	75.46	0000

Quality of Life

Individual Components of Quality of Life: Table 11 provides descriptive information on the 5 components of quality of life based on the gender and rank categories.

Table 11. Quality of Life for Navy Men and Women (SEE NOTE), Percentage By Category, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

HOW DO YOU FEEL ABOUT YOUR:		NEGATIVE	MIXED	POSITIVE	MEAN	STANDARD DEVIATION	t-SCORE
Job	Men	31.6%	29.8%	38.6%	-0.009	1.59	0.81
	Women	32.0%	32.1%	35.9%	-0.064	1.52	
Personal life	Men	9.2%	17.4%	73.4%	1.31	1.41	-0.15
	Women	9.7%	16.1%	74.3%	1.32	1.43	
Health & physical condition	Men	9.2%	17.3%	73.5%	1.13	1.25	4.73**
	Women	13.6%	21.6%	64.8%	0.86	1.29	
Family	Men	5.6%	10.0%	84.4%	1.87	1.33	-0.10
	Women	3.6%	8.6%	87.8%	1.88	1.20	
Life as a whole	Men	6.5%	13.9%	79.6%	1.46	1.29	0.57
	Women	5.1%	13.9%	81.0%	1.43	1.20	

Note: The E7-E9 and Officer/Warrant Officer rank groups are not significantly different on the Health/Physical Condition (or any other Quality of Life) measure. ** $p < 0.001$

The focus in this analysis is on those individuals who report being "mostly dissatisfied," "unhappy," and feeling "terrible." The largest amount of dissatisfaction for both men and women relates to the perceived quality of one's job (or military duties). Overall, 31.6% of the men and 32.0% of the women report dissatisfaction. There is much less overall dissatisfaction for men and women for personnel life (9.2% and 9.7%), health and physical condition (9.2% and 13.6%), family life (5.6% and 3.6%), and for life as a whole (6.5% and 5.1%). Of these differences, only the health domain (men more satisfied than women) represents a significant gender difference ($t = 4.73$, $p < 0.000$).

Quality of Life Scale: There is no significant difference in the overall mean quality of life scores for men and women as measured by the study's Quality of Life summary measure. Men and women have positive scores representing what might be described as being "mostly satisfied" (Mean of 1.16 and a SD 0.985 for men and a Mean of 1.09 and a SD of 0.91 for women). While the junior enlisted men and women have statistically significant lower mean scores than some of the more senior rank groups, these differences are small and do not appear meaningful. Each gender/rank group has a mean score in the range of "mixed" to "mostly satisfied." Overall, only 10.4% of the men and 9.0% of the women participants report a negative perception of their overall quality of life as measured by this scale. This 4% increase in

dissatisfaction is primarily a function of the substantial negative view of military duties among both men and women.

The Relationship Between Psychological Distress and Quality of Life

Tables 12 and 13 examine the relationship between life stress associated with being aboard ship, overall stress and coping. The stepwise, hierarchical regression controls for race/gender group and age, then marital status and rank group before looking at the effect of stress associated with being aboard ship, and finally overall stress and coping. This information suggests the importance of stress associated with being aboard ship, overall life stress, and coping as contributors to understanding perceived quality of life for both men and women. In fact, the similarities between men and women in this stress-coping model are obvious. Being aboard ship is negatively associated with overall quality of life even after taking into consideration various demographic differences. Overall perceived stress and coping provide added information.

Table 12. Stepwise, Hierarchical Multiple Regression: Correlates of Quality of Life, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.
Men Participants

VARIABLE	R	ADJUSTED R^2	R^2 CHANGE	t	SIG t
Race/Ethnic Group Age	0.10	0.01	0.01	0.25 1.48	0.81 0.13
Marital Status Rank	0.15	0.02	0.01	-1.86 1.71	0.06 0.09
Stress of being aboard ship	0.33	0.10	0.08	-4.43	0.000
Current overall life stress Current perceived coping	0.49	0.24	0.16	-10.96 5.08	0.000 0.000

F = 41.40, DF = 7/910, p < 0.000

Table 13. Stepwise, Hierarchical Multiple Regression: Correlates of Quality of Life, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.
Women Participants

VARIABLE	R	ADJUSTED R^2	R^2 CHANGE	t	SIG t
Race/Ethnic Group Age	0.04	0.00	0.00	0.83 -1.24	0.41 0.22
Marital Status Rank	0.10	0.01	0.01	0.74 1.89	0.46 0.06

VARIABLE	R	ADJUSTED R^2	R^2 CHANGE	t	SIG t
Stress of being aboard ship	0.30	0.08	0.07	-4.45	0.000
Current overall life stress Current perceived coping	0.51	0.25	0.17	-10.99 6.86	0.000 0.000

$F = 47.02$, $DF = 7/945$, $p < 0.000$

SUMMARY AND DISCUSSION

This overall Navy study and the issues addressed in this preliminary report focus on military living conditions aboard ship, military duties and duty relationships, and other aspects of military service life and associated personal and family relationships. The presentation follows a traditional stress, stress response, and psychosocial outcome model. The specific issues considered as core stressors relate to what can be viewed as a broadly defined occupational health study. The focus of the gender comparisons are designed to highlight issues for women who are occupying what can be considered non-traditional occupational roles and/or non-traditional employment conditions (like shipboard status and deployment).

This study has made use of separate rank comparisons in the analysis of similarities and differences between men and women. Rank also reflects a number of important socio-demographic characteristics (age, life stage, income, etc.) and the approach helps to solve the problem with over representation in the sample of mid-level enlisted men and women.

Important Initial Findings: Based on the data presented in this preliminary report, a number of observations are worth noting. These observations also provide direction for the next level of analyses for these and subsequent study data.

Demographic differences exist in the within-rank group comparisons of men and women. Enlisted women have more formal education, and they are less likely to be married. The more senior women are more likely to be separated or divorced. Each of these characteristics relates to personal and interpersonal resources that may have an important relationship to stress and coping, as well as overall quality of life.

Overall, 70% of the men and women in this sample report a moderate to extreme amount of stress in their life during the past two weeks. While the samples of senior men and women are very small, women officers and the E7-E9 rank groups, as a whole, have the highest mean stress scores across all rank groups.

For these "stressed" men and women, a quarter to a half perceive shipboard living conditions as highly stressful (i.e., crowded conditions, lack of privacy, and personal safety).

Men and women differ slightly on the perceived sources of this stress but the overall, within-rank group differences between men and women are slight.

The shipboard duty (workplace) environment is viewed by men and women as a substantial source of current stress. Overall, 74% of the men and 72% of the women in this stressed group said that "the way things are typically done aboard ship" was a source of moderate to extreme stress. In the junior rank groups, a higher percentage of women report the duty environment as a source of stress. In the senior rank groups, men report higher stress scores. One-half of the most senior men and women report supervisor and peer relationships as important sources of stress, and 50% of men and women in supervisory positions report that those they supervise are a source of a substantial amount of stress.

Military career and personal life conditions represent substantial sources of stress for both the men and women in the stressed group. Women typically report experiencing these stressors in the same way, or at least in the same magnitude as men. Among these stress conditions, personal finances was a source of moderate to extreme stress for 59% of the men and 54.7% of the women. This difference was most pronounced in the E7-E9 rank group (60% of the men versus 41% of the women). This does not mean that the senior men and women have more financial problems than younger personnel. It only means that finances are a greater source of life stress for these senior personal.

Differences exist between men and women regarding the relationship between military life stress conditions and overall life stress. The way things are typically done abroad ship is the most influential variable for men. Women endorse "the people I work with" as the most influential stress variable. "My inability to maintain personal hygiene aboard ship" and "the people I share living space with aboard ship" are significant but somewhat less important sources of life stress for women. They are not significant sources of stress for men.

Strong positive relationships exist between the perception of overall current life stress and perceptions of duty performance and personnel life performance. Gender or rank differences are not present in these relationships. The strong relationship between duty performance and personal life performance is not influenced by gender or rank. Overall, 36.4% of participants said that the study's life stress conditions had a moderate to extreme negative effect on their military duty performance. Only, 7.3% said that these life stress conditions negatively affect their personal life. Men and women do not differ in their appraisals. Three-fourths of all participants said that overall they are coping moderately well to extremely well despite these stressors. More E7-E9 men than women report "quite a bit to an extreme amount of stress affecting their job performance (19.2% versus 6.2%). Overall, the E4-E6 women have worse personal life scores.

Junior enlisted men and women have an overall mean score on the CES-D distress scale that is above the established cut point for emotional distress. The more senior the group, the lower the distress score. Women's CES-D scores are higher than men's and the greatest

difference is for E4-E6 women. This supports this groups self assessment of how well things are going in their personal life.

For both men and women, the stress of being aboard ship is a good predictor of their distress scores. In addition, overall military life stress conditions provides an additional contribution in explaining participants' distress scores.

The job (military duties) aspect of quality of life was the source of the most dissatisfaction for participants regardless of rank or gender. Overall, one third of men and women report dissatisfaction with their military duties. Only 9.2% of the men and 9.7% of the women report serious dissatisfaction with their personal life. Men and women, regardless of rank, are "mostly satisfied" with the overall quality of their life. The only gender difference is some increased dissatisfaction for women with health and physical condition. Only about ten percent of men and women report a negative perception of their overall quality of life. The stress of being aboard ship is related to a lower overall quality of life score. In addition, other aspects of overall military life stress are associated with lower quality of life scores.

Limitations: This sample represents only the initial data available in an ongoing study. These findings can not be construed to represent all military women, all Navy women, or even all Navy women assigned aboard ship. Clearly, the current sample over-represents mid-level enlisted women and under represents other rank groups. Despite these limitations, these data do provide direction for future analyses. They also suggest that the study measures are valuable in their ability to shed light on a number of important military life and duty stress issues.

Future Directions: It will be necessary to re-examine the issues and the findings presented in this paper as additional data are available. It will then be possible to develop and test a number of important hypotheses that relate to various psychosocial stress models. These shipboard, duty, and military life stressors and psychosocial stress outcomes need to be examined in relationship to a number of health and health care measures. Structural, operational, and interpersonal moderators of these life stressors and stress outcomes require further elaboration.

CONCLUSION

This article highlights a broad range of descriptive information on psychosocial stress and well being for Navy men and women assigned to shipboard status. It represents initial information from an important longitudinal study of the physical and psychosocial health and well being of women assigned aboard ship. Military duties and military life are stressful. The consequences of these military life and duty stressors impact on military members, their families, and our nations' security. Knowledge of the stressors and stress consequences, and information on ways to moderate these variables are critically important challenges to military health care professionals and health scientists.

Index Terms

Navy, Sea Duty, Stress, Distress, Psychological Well-being, Coping, and Quality of Life

Notes:

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APPENDIX G.7

Family Composition: Correlates With Quality of Life, Health, Stress, and Coping of Women Aboard Ship

Dorothy J. Jeffreys, Ph.D., Theresa Russo, Ph.D., and Lea Dougherty, M.S.W.

REPORT TOPIC AREA: FAMILY COMPOSITION: CORRELATES WITH QUALITY OF LIFE, HEALTH, STRESS, AND COPING OF WOMEN ABOARD SHIP

LEAD AUTHORS: Dorothy J. Jeffreys, Ph.D., Theresa Russo, Ph.D. and Lea Dougherty, M.S.W.

ABSTRACT

This report examines and compares the life of Navy women and men assigned to ships. Family composition and age of children are examined to determine their effect on the service member's quality of life, health, distress, stress, coping ability and support. Service women were matched with service men on ship, occupation aboard ship, department, race/ethnicity, pay grade, and date of birth. The eligible population included all service members assigned to 22 ships in 1994-1995. The median response rate for women was 67%. Participants were generally satisfied with their overall quality of life. However, family composition was associated with quality of life, distress, child and relationship stress and coping ability. Age of the children was associated with the woman's satisfaction with her job, her emotional problems, stress with children, and ability to cope. Satisfaction with spouse, distress, relationship and child stress differed significantly by gender. Family was rated as the most helpful source of support.

Military-induced family separation is the major dissatisfaction with military life and is very stressful for military families. Symptoms of stress related to separation include increased physical illness, low frustration tolerance, and social isolation.

Deployment-related issues for women are of particular importance to the military. Women may face more stress-related illnesses than men due to feeling pressure to prove themselves, role conflict to perform like men, and the need to conform to standards of femininity held by men. Little is known about how the military member deals with separation from family and the influence this may have on health.

INTRODUCTION

The Women Aboard Navy Ships Comprehensive Health and Readiness Project is the basis for this report, which focuses on and compares Navy women to Navy men: quality of life; physical and emotional health; distress, stress, coping, and support as related to family composition and age of child.

The primary conceptual model for examining military-induced separation has been the ABC-X family stress model, modified to the Double ABC-X model for further study of family adaptation to stressors [8]. The goal of much military family research has been to identify stressors which families face and the resources used to cope with them. Excessive stressors,

particularly within a short period of time, may deplete a family's resources, making coping difficult and creating a high probability of family disruption.

More recently, a developmental model was introduced into the discussion of military families [9], suggesting that military families may cope differently with stressors according to the family's developmental level. Family Development Theory indicates that families are working on developmental tasks specific to their position in the family life cycle. Common stressors have been identified as typical for each stage. This has significant implications in that families that do not adapt well to military lifestyle may have poor health, perform poorly in their job, have poor family relationships, and/or separate from the military.

There are two relevant issues related to deployment of women. The first is that the military is deploying increased numbers of servicewomen for training, humanitarian, and combat reasons. The second is that very little previous research has addressed separation issues faced by servicewomen and their families. Consequently, questions remain unanswered as to the extent of the servicewomen's quality of life, their physical and emotional health, amount of stress and coping abilities.

Deployment related issues for women are of particular importance to the military. Women may face more stress-related illnesses than men due to feeling pressure to prove themselves, role conflict to perform like men, and the need to conform to standards of femininity held by men [10,11]. Separation from family is a serious stressor for military families and can create increased symptoms of physical illness [4,5,13]. During Operation Desert Storm women and men reported many kinds of health problems, but few were gender related [12]. Little is known about how the military member deals with separation from family and the influence this may have on their health. Similar to research on physical health, the primary focus of emotional health aspects has been on the spouse (primarily wife) and children of the deployed service member.

Stress

Service members experience considerable stress related to feelings about separation, job demands, and concern over the well-being of the family [12].

Child Stress. There are numerous studies on the effects of absence of father on children, but little on absence of mother and none on the stress to women due to their concern of their children when deployed. Children whose father is absent have been found to manifest both emotional problems and behavioral problems [14,15]. Lengthy separations may cause more detrimental effects than shorter ones, and first time separations may be the most difficult [15,16].

Child care issues also become compounded in times of deployment. When a servicewomen deploys, if married, she must be able to rely on her spouse to provide care for the children. If she is a single parent or married to another service member who is also eligible for deployment,

she must attempt to arrange for care for the children. Child care issues have been found to be significantly related to multiple role strain for working women [17].

Relationship stress: Separation has a major impact on relationships. The absence of the military service member creates ambiguity of boundaries and roles, and may create a great deal of conflict and even dissolution of the relationship. Common problems for military spouses are loneliness, problems with children and physical illness [18]. Communications with family and friends is also a problem for service members who are deployed. Newly married couples are particularly vulnerable to disruption caused by separation because they have had less time to solidify their relationship [19].

METHODS

This study is part of the Women Aboard Navy Ships Comprehensive Health and Readiness Research Project conducted at the Naval Health Research Center in San Diego, California, as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. This epidemiological research project utilizes several data collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important characteristics. The study has a longitudinal design with women and men enrolled in Year 1 of the study being contacted again and re-surveyed on a 12-month cycle in Year 2. All women reporting aboard ship (and matched men) in Year 2 also will be enrolled. This report is based on 9 months of data collection of a 50% random sample of the population. This period of data collection was 15 November 1994 through 30 October 1995.

Population

All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1. An equal number of men serving aboard ship matched on relevant characteristics were also eligible. The Navy Bureau of Personnel (PERS-OOW) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were determined to be eligible for inclusion in the study, based on having women assigned. This report is based on the first 22 ships surveyed (Table 1). These ships were surveyed based on availability as determined by the commanding officer and medical department of each ship. These ships had 3,813 women and 11,985 men assigned aboard.

Table 1. Ships Surveyed by Ship Type and Crew Sizes by Gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	NAME OF SHIP	SHIP TYPE	FEMALE CREW	MALE CREW	TOTAL CREW
1	USS PLATTE	OILER	85	183	268
2	SS SHENANDOAH	DESTROYER TENDER	497	1,041	1,538
3	USS GRAPPLE	SALVAGE SHIP	36	67	103
4	USS SANTA BARBARA	AMMUNITION SHIP	87	290	377
5	USS MOUNT BAKER	AMMUNITION SHIP	72	292	364
6	USS BARRY	GUIDED MISSILE DESTROYER	19	319	338
7	USS FRANK CABLE	SUBMARINE TENDER	308	923	1,231
8	USS DIXON	SUBMARINE TENDER	397	981	1,378
9	USS DETROIT	FAST COMBAT SUPPORT SHIP	63	548	611
10	USS SHASTA	AMMUNITION SHIP	72	340	412
11	USS McKEE	SUBMARINE TENDER	438	1,128	1,566
12	USS CAMDEN	OILER	69	576	645
13	USS L.Y. SPEAR	SUBMARINE TENDER	394	1,038	1,432
14	USS KISKA	AMMUNITION SHIP	75	321	396
15	USS LASALLE	MISC COMMAND SHIP	56	403	459
16	USS SIMON LAKE	SUBMARINE TENDER	338	793	1,131
17	USS MONOGAHELA	OILER	97	195	292
18	USS GRASP	SALVAGE SHIP	27	87	114
19	USS EISENHOWER	AIRCRAFT CARRIER (NUCLEAR PROP)	524	4,476	5,000
20	USS SUPPLY	FAST COMBAT SUPPORT SHIP	7	594	601
21	USS JOHN YOUNG	DESTROYER	24	306	330
22	USS RAINIER	FAST COMBAT SUPPORT SHIP	74	507	581
23	USS CURTIS WILBUR	DESTROYER	23	328	351

	NAME OF SHIP	SHIP TYPE	FEMALE CREW	MALE CREW	TOTAL CREW
24	USS CORONADO	MISC COMMAND SHIP	55	549	604
25	USS CAPE COD	DESTROYER TENDER	424	1,145	1,569
26	USS MOUNT HOOD	AMMUNITION SHIP	96	329	425
27	USS COMSTOCK	DOCK LANDING SHIP	37	298	335
28	USS FLINT	AMMUNITION SHIP	90	309	399
29	USS MAUNA KEA	AMMUNITION SHIP	27	287	314
30	USS CIMARRON	OILER	53	149	202
31	USS WILLAMETTE	OILER	71	167	238
32	USS SAFEGUARD	SALVAGE SHIP	25	78	103
33	USS SALVOR	SALVAGE SHIP	23	81	104
34	USS YELLOWSTONE	DESTROYER TENDER	425	946	1,371
35	USS MT. WHITNEY	AMPHIBIOUS COMMAND SHIP	79	616	695
36	USS EMORY S. LAND	SUBMARINE TENDER	457	1,069	1,526
37	USS HOLLAND	SUBMARINE TENDER	360	1,021	1,381
38	USS SACRAMENTO	FAST COMBAT SUPPORT SHIP	68	546	614
	TOTALS		**6,072**	**23,326**	**29,398**

Matching

The men aboard ships included in this study were matched to women on the following characteristics: ship, work division, department, race (white, black, Hispanic, and other), pay grade (E1-E3, E4-E6, E7-E9, O1-O3, O4-O6), rating (if no individual was available in the same rating, an individual with a closely related rating was selected), and date of birth (nearest date of birth, not to exceed plus or minus two years). Warrant officers were grouped with E7-E9 pay grades. In the infrequent instances where these criteria could not be met, men that matched as closely as possible to women were selected.

Sample

The enormous data collection requirement and corresponding concern about participant

burden led to data being collected using four versions of the survey that contained a core of identical items and a subsequent section containing different subsets of additional questions on each form type. Two of the four versions of the randomly assigned survey instruments contained the data used in the current analysis. Information was available for 2,103 participants (1,064 women and 1,039 men. This was a 497 random sample of the population surveyed. Comparisons in Table 2 suggest that there are only slight differences in the participants completing the questions of interest for this report.

Table 2 . Demographic and Military Information, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLES	MALES		FEMALES	
	Mean	**S.D.**	**Mean**	**S.D.**
Age	26	6.3	26	6.1
Race	**Number**	**Percent**	**Number**	**Percent**
White, non-Hispanic	540	52	530	50
White, Hispanic	56	5	59	6
Black, non-Hispanic	308	30	325	31
Black, Hispanic	16	2	30	3
Asian/Pacific Island	42	4	42	4
Native American	14	1	13	1
Other	56	5	53	5
Education	**Number**	**Percent**	**Number**	**Percent**
Some High School	22	2	4	0.4
High School Grad	603	58	513	58
Trade/technical	44	4	33	3
GED	47	5	28	3
Some College/AA	269	26	400	38
4-year College	40	4	70	7
Graduate/Prof Degree	13	1	15	1
Family Composition	**Number**	**Percent**	**Number**	**Percent**
Single without Child	432	42	540	49
Single with Child	78	8	169	16
Married without Child	147	14	163	15
Married with Child	381	37	209	20

VARIABLES	MALES		FEMALES	
	Mean	S.D.	Mean	S.D.
Pay grade	**Number**	**Percent**	**Number**	**Percent**
E1-E3	316	16	329	30
E4-E6	608	59	629	57
E7-E9	58	6	46	4.4
All Warrant Officers	0	0	2	0.2
All Officers	35	4	43	4
Years of Active Duty	2.6	1.3	2.4	1.2
Years Aboard Ship	4.2	3.4	2.4	1.9
Years Aboard Current Ship	1.6	1.4	1.4	1.3
Ship Status	**Number**	**Percent**	**Number**	**Percent**
In Home Port	895	86	895	84
At Sea	97	9	95	9
In Port (not home)	10	1	19	2
In Shipyard	17	2	24	2
Other	15	1	18	2
Times Deployed	7	10.5	4	4
Where live when in Home Port	**Number**	**Percent**	**Number**	**Percent**
Aboard Ship	364	35	320	30
Navy Housing	105	10	79	7
Bachelor Enlisted Quarters/ Bachelor Officers Quarters	4	0.4	5	0.5
Other	565	54	653	61

Instruments

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities [1-2] were adopted for use in this study. Instruments included in the current analysis were:

Quality of Life. This instrument examined on a seven point Likert-type scale the respondents' satisfaction or dissatisfaction with life in each of seven domains: overall quality of life, health and physical condition, job, personal life, family, spouse, and children.

Physical and Emotional Health. Self reported health and emotional problems were screened for the following question: "Have you been unable to perform your military duties for 1 or more days because of health problem or emotional problem?" Respondents provided a no

or yes response.

Depression. A short form of the Center for Epidemiological Studies Depression Scale (CES-D) measured depression [20]. This short version correlated 0.92 with the full CES-D and had an alpha reliability of 0.83. Respondents were asked how many days during the past seven days did each of the seven things happen to them, providing an index of depression. The depression scale consists of scores ranging from 0 to 21, with a cut point score of 5.6 for depression [21]. The modified seven-item scale used in this study had a Cronback alpha coefficient of 0.87 for women and 0.88 for men.

Current Overall Life Stress and Sources of Stress. Overall current life stress was measured by respondents being requested to think about their life as a whole over the past two weeks and rating on a five point Likert-type scale from "none at all" to "extreme amount", "How much stress do you think is in your life right now?" Sources of stress were measured by items of the stress scale that was determined by a factor analysis to measure child and relationship stress (3 items each) [22,23]. Factor loading for the child items ranged from 0.85 to 0.77, with an alpha coefficient of .86, and relationship items ranged from .78 to .47, with alpha coefficient of .67.

Coping. Coping ability was estimated by asking: "During the past 2 weeks, how well have you coped with these stresses?" The responses were rated on the same Likert-type scale used to measure stress.

Support. Participants were asked to rate sources of support from "very unhelpful" to "very helpful." Sources were family, friends on board ship, other friends in the Navy, other friends not in the Navy, chaplains, ministers, or other clergy, other Navy professionals, and your ship's leaders.

Two questions were modified to measure family composition and age of children; marital status and age of children. Family composition was stratified into four groups. Single (never married, separated, divorced, or widowed) without children, single (never married, separated, divorced, or widowed) with children, married without children, and married with children. Four age groups of children were defined: infant/toddler (newborn to 35 months), preschool (three to five years), school age (6 to 12 years), and adolescent (13 to 20 years).

Survey Administration

The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign an informed consent statement and asked to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all study subjects to remain in one area, survey questionnaires were distributed, and the participants were allowed to fill them

out in work spaces. All completed questionnaires were collected in sealed envelopes by study staff, regardless of where completed.

RESULTS

The overall median ship response rate for the 22 ships was 65%. The overall median response rate for women was 67%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had an overall median response rate of 74% compared to ships with more than 100 women assigned, which had an overall median response rate of 50%.

This paper will report on the following dependent variables: quality of life; physical and emotional health; distress; stress and coping ability as related to family composition and age of child. In addition, seven questions about sources of help that were considered to have a possible effect on the dependent variables were examined. Possible intervening variables that were examined are age, race, education, pay grade, number of years on active duty, years aboard ship(s), years aboard current ship, where the respondent lives when the ship is in home port, current ship status, and deployment.

Quality of life issues, stress, distress, and coping were examined by ANOVAS and multiple stepwise regressions, while chi-square and discriminate analyses were used to investigate physical and emotional health variables. Mean scores and standard deviations for each dependent variable by gender, family composition, and age of child are shown in Tables 3-5.

Table 3. Dependent Variables by Gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	GENDER			
	MEN		WOMEN	
	Mean	S.D.	Mean	S.D.
Quality of Life - Whole Life	5.46	1.29	5.43	1.2
Quality of Life - Job	3.99	1.56	3.94	1.52
Quality of Life - Personal	5.31	1.41	5.32	1.43
Quality of Life - Health	5.13	1.25	4.86	1.29
Quality of Life - Family	5.87	1.33	5.88	1.2
*Quality of Life - Spouse	5.74	1.68	5.4	1.93
Quality of Life - Children	6.39	1.19	6.53	1
Life Stress	3.25	1.12	3.33	1.05
Coping Ability	3.41	1.25	3.35	1.22
*Distress	6.11	5.59	6.95	5.6
Relationship Stress	5.26	2.95	5.3	3.05
*Child Stress	4.44	3.37	4.9	4.46

*Indicates significance

Table 4. Dependent Variables by Family Composition, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	FAMILY COMPOSITION							
	Single Without Children		Single With Children		Married Without Children		Married With Children	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
*Quality of Life - Whole Life	5.32	1.33	5.3	1.28	5.62	1.09	5.59	1.13
*Quality of Life - Job	3.82	1.54	3.96	1.57	3.94	1.56	4.2	1.5
*Quality of Life - Personal	5.09	1.46	5.02	1.47	5.69	1.28	5.59	1.3
Quality of Life - Health	4.99	1.31	4.87	1.33	5.06	1.25	5.01	1.23
*Quality of Life - Family	5.75	1.35	5.74	1.34	5.97	1.18	6.07	1.12
*Quality of Life - Spouse	3.56	2.49	2.29	1.89	6.04	1.51	5.84	1.47
*Quality of Life - Children	5.69	1.95	6.64	0.9	6.06	1.66	6.53	0.88
Life Stress	3.27	1.09	3.36	1.08	3.27	1.07	3.33	1.08
*Coping Ability	3.3	1.21	3.19	1.23	3.49	1.27	3.52	1.24
*Distress	7.17	5.59	7.24	6.14	6.19	5.48	5.48	5.33
*Relationship Stress	5.4	3.15	5.64	3.34	4.9	2.61	5.12	2.75
*Child Stress	1.94	2.93	7.46	3.79	1.83	2.4	6.52	3.09

*Indicates significance

Table 5. Dependent Variables by Age of Child, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	AGE OF CHILD							
	Toddler		Preschool		School Age		Adolescent	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Quality of life - Whole Life	5.52	1.29	5.42	1.31	5.54	1.09	5.56	.98
*Quality of Life - Job	4.01	1.48	3.94	1.54	4.29	1.54	4.27	1.45
Quality of life - Personal	5.61	1.33	5.28	1.55	5.43	1.30	5.32	1.31
Quality of Life - Health	4.99	1.34	4.97	1.31	5.01	1.22	4.87	1.13
Quality of Life - Family	6.14	1.13	5.95	1.26	5.96	1.20	5.82	1.16
Quality of Life - Spouse	5.74	1.73	5.40	1.82	5.51	1.80	5.61	1.52
*Quality of Life - Children	6.78	.71	6.73	.68	6.51	.93	6.06	1.14
Life Stress	3.31	1.34	3.32	1.05	3.35	1.08	3.40	1.04
*Coping Ability	3.21	1.24	3.32	1.28	3.59	1.23	3.60	1.17
Distress	5.86	5.51	6.19	5.91	6.05	5.80	5.76	5.08
Relationship Stress	5.21	2.92	5.15	2.93	5.31	2.96	5.49	2.98
*Child Stress	6.54	3.47	7.44	3.39	6.80	3.15	6.17	3.23

*Indicates significance

Quality of life

Life as a whole. Quality of life as a whole differed significantly according to family composition, $F(3,2066)=9.31$, $p<0.001$, but not by gender or age of children. Married respondents reported greater satisfaction than the single respondents.

Job. Family composition and age of children was associated with job quality of life: $F(3,2060)=7.43$, $p<0.001$ and $F(3,837)=2.93$, $p<0.05$, respectively. Married respondents with children reported the highest satisfaction and singles without children the least. Respondents with preschool children were less satisfied than those with children in the other three groups. Differences by gender were not found. The variables predicting job quality of life were quality of life as a whole, distress, age, and child care stress; R^2 of 0.22, $p<0.001$.

Personal life. The quality of personal life was associated with family composition; $F(3,2068)=7.43$, $p<0.001$, but not by gender or age of children. While personal life mean scores of all groups denoted satisfaction, married respondent's scores were higher than those of the single respondents. Quality of life with spouse, as a family and as a whole, relationship stress and family composition predicted personal quality of life, $R^2 = 0.64$, $p<0.001$.

Health. How respondents feet about their health was not significantly related to gender, family composition, or age of children. Overall, there was a higher satisfaction than dissatisfaction.

Family. Quality of life as a family was significantly different according to family composition, $F(3,2037)=9.14$, $p<0.001$, but not gender and age of children. Married respondents' scores were higher than single. Several variables significantly predicted respondents' quality of family life, $R^2=.64$, $p<0.001$: quality of personal life, life as a whole, life with children and spouse, relationship stress, race and gender.

Spouse. Significant differences, according to gender and family composition, were found in how respondents feet about their spouse; $F(1,994)=9.06$, $p<0.01$ and $F(3,993)=100.98$, $p<0.001$. Women reported less satisfaction with their spouse than men. Married respondents reported higher satisfaction, while single group respondents, including those who were never-married, separated, divorced, or widowed) reported dissatisfaction. Quality of life with spouse was significantly associated with personal quality of life, family composition, quality of family life, relationship stress, and gender; $R2=.67$, $p<.001$.

Children. Scores on quality of life with children were associated with age of children and family composition, $F(3,806)=22.30$, $p<0.001$ and $F(3,939)=19.58$, $p<0.001$. The younger the children, the higher the satisfaction, with married higher than single. Quality of family life, age of respondent and children, and years aboard ship accounted for 30 percent of the variance

in quality of life with children.

Physical problems

Only 19% of the women and 14% of the men reported having experienced physical health problems within the last 30 days. There were no significant differences in reports by gender, family composition, or age of children. Single parents with preschool and school age children reported slightly more physical health problems than married parents with preschool and school age children. Men were found to report slightly more physical health problems when their ship was in port (other than home). Similarly, both married and single respondents with children reported slightly more physical health problems while ship was in port (other than home) or in the other category.

Discriminant analysis selected relationship stress, overall life stress, and quality of life in regard to health issues as variables contributing the most variance in analyses comparing those reporting any health problem with those reporting no health problems. The single discriminant function ($\chi^2 = 64.25$, $p < 0.01$) was significant and correctly classified 68% of the cases. The function accounted for 37% of the variance between groups.

Emotional problems

A total of 4% of men and 5% of women reported emotional problems. When examining emotional problems by gender, family composition, and age of children, the only significant difference was by age of children for women ($\chi^2 = 9.90$, $p < 0.01$), and by age of children for married service members ($\chi^2 = 7.82$, $p < .05$). Significantly more women with preschool age children reported emotional problems than those with children of other ages, and significantly more married servicewomen with preschool age children reported emotional problems than single servicewomen with other age children.

For two groups, those who reported health problems and those who did not, the single discriminant function ($\chi^2 = 57.59$, $p < .001$) was significant and correctly classified 83% of the cases. The function accounted for 41% of variance between groups, with mood/distress, coping ability, and gender contributing the most variance.

Distress

A significant difference was found for distress and gender, $F(1,2064) = 11.52$, $p < .001$), family composition, $F(3,2065) = 12.71$, $p < .001$), stress, $F(1,2051) = 287.40$, $p < .001$), and length of time on active duty, $F(5,2025) = 7.54$, $p < .001$). Females reported more distress than men and single respondents reported more distress than married. Service members that reported experiencing life stress were more distressed, and the longer a service member was on active duty, the less distress they reported.

Stress

Life stress. Gender, family composition and age of child did not differentiate life stress. All groups reported moderate stress.

Relationship stress. Relationship stress was significantly related to family composition $F(3,2054)=3.86$, $p<0.01$. Relationship stress was highest for single personnel with children, followed by single without children, then married with children. A significant difference in relationship stress was also found by ship status $F(4,2051)=3.65$, $p<0.01$. Stress being highest when ship is at sea (Table 6). A significant amount of variance ($R^2=.36$) was accounted for by quality of family life, child stress, quality of personal life distress and quality of life with spouse.

Table 6. Other Variables Effecting the Dependent Variables, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE												
Time on Active Duty	**0-2 Yrs.**		**3-5 Yrs.**		**6-10 Yrs.**		**11-15 Yrs.**		**16-20 Yrs.**		**21 + Yrs.**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Coping	3.31	1.2	3.24	1.26	3.43	1.2	3.59	1.1	3.62	1.1	3.88	1.0
Ability		5		6		0		9		7		2
Ship Status	**Home**		**Sea**		**Port (other than home)**				**Shipyard**		**Other**	
	Mean	**SD**	**Mean**	**SD**	**Mean**		**SD**		**Mean**	**SD**	**Mean**	**SD**
Relationship	5.21	2.9	6.02	3.5	5.33		3.5		4.78	2.2	4.82	2.3
Stress		3		1			8			2		8
Experiencing Stress	**No**						**Yes**					
	Mean		**SD**				**Mean**		**SD**			
Coping	3.63		1.5				3.3		1.1			
Ability			0						2			

Child stress. There is a significant main effect for child stress, $F(4,1458)=248.14$, $p<0.001$; effect by family composition, $F(3,1459)=328.05$, $p<0.001$; effect by gender $F(1,1461)=16.68$, $p<.001$, and a significant interaction by family composition and gender $F(3,1459)=32.15$, $p<.001$. Significantly more stress is reported by females than males, by single and married Service members with children than by single and married service members without children. Service members with preschool children reported the highest stress level. For females, child stress decreases as the child gets older, whereas for males more stress is reported when they have a toddler or adolescent. Distress, gender, relationship stress, quality of life with spouse, race, overall stress and ship status accounted for a significant amount (27%) of variance in scores.

Coping

An ANOVA for coping in the past two weeks by family composition and gender found a significant overall main effect of $F(4,2025)=4.8$, $p<0.001$) a main effect for coping within the past two weeks by family composition ($F(3,2028)=6.05$, $p.<0.001$), but the main effect for gender and the interaction were not significant. The amount of variance explained by family composition was significant ($F(3,2028)=3.5$, $p<0.001$).

An analysis of variance of coping in the past two weeks by age of kids and gender found a significant main effect $F(4,811)=4.08$, $p<0.01$; and by age of kids $F(3,812)=5.41$, $p<0.001$; but not for gender. Families with older children cope better than those with younger children.

A significant difference was found for coping within the last two weeks by stress and family composition: main effect $F(4,2004)=12.35$, $p<0.001$; stress ($F(1,2007)=28.02$, $p<0.001$; and family composition $F(3,2005)=7.35$, $p<0.001$. A significant interaction was also found $F(3,1005)=2.64$, $p<0.05$. Results suggest that coping is better when there isn't stress than when there is stress (Table 6); coping is higher for married service members than for single servicemembers; and married and single with children than without children.

A significant effect was found for coping by ship status by family composition: main effects, $F(8,1984)=4.85$, $p<0.001$; time on active duty, $F(5,1987)=3.74$, $p<0.01$; and family composition, $F(3,1989)=4.17$, $p<0.001$. The explained variance is significant, $F(22,1970)=2.33$, $p<0.001$. Coping increases as time on active duty increases (Table 6).

Although significant, only 11% of the variance in respondents' score on ability to cope over past two weeks was predicted by age of children, and quality of life as a whole.

Sources of Support

In general, both males and females across family composition and age of children groups rated family as the most helpful source of support. Chi-square analyses were significant for females by age of children for clergy ($\chi^2 = 24.59$, $p<0.05$) and Navy professionals ($\chi^2=27.22$, $p<0.01$) as sources of support, whereas friends on ship were sources of support for males by age of children ($\chi^2=22.79$, $p<.05$).

DISCUSSION

Historically, family development theorists have emphasized that families may have difficulties in making transitions, suggesting that the transition of servicewomen serving aboard ships can lead to problems. This study found that females as well as males assigned to ships faired quite well. While prior research has suggested females have more stress related illnesses, than males, this study found few service members who reported physical and emotional problems

and gender differences were not found [10,11].

Differences in stress, relationship stress, quality of life issues, distress, and coping were found by the make-up of the family. Stress seems to increase when time and responsibilities related to raising a child increase [24]. In the Olson, et al. study fathers who had adolescent children reported higher stress, while mothers with young and school age children reported higher stress [24]. Similarly, this current study found single and married service members with children suffered with stress of child care, and this stress increased with younger children for mothers, whereas fathers reported more stress with toddlers and adolescents. Stress with relationships increases by the separation issue, as relationship stress was highest for service members when their ship was at sea.

Quality of life issues were found to be interrelated with family, spouse, children, personal life, and life as a whole and predictors of each other. In addition, stress related to relationships was found to be a significant predictor of quality of life issues. These findings are also supported by the Olson , et al. study where family and marital satisfaction overlap with life satisfaction as a whole [24].

Findings indicated that the less stress a service member has, the better their coping, and that service members tend to cope better when they are married and have children. Service members also reported families give the greatest amount of support. This is consistent with the research that says families cope with stress by relying on internal (family) resources more than external ones [24]. However females with children reported support of clergy and other Navy professionals helpful, while males reported friends on ship helpful. Coping ability was found to increase as active duty time increased, which supports the finding of Field where first time separations were the most difficult [16].

CONCLUSIONS AND IMPLICATIONS

Families can be a source of stress as well as support. When family support is adequate or it is supplemented by support from others quality of life is better. It therefore follows that support given to families by service personnel can improve the service members life making it more manageable and meaningful. When life is manageable and meaningful to service members they are satisfied with their job and retention is greater.

Notes:

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APPENDIX G.8

Comparison of Psychological Symptomatology According to the Brief Symptom Index in Women and Men Aboard Navy Ships, and Comparison With Army Data on Personnel Deployed During Operation Desert Shield and Desert Storm

Kathleen M. Wright, Ph.D.

REPORT TOPIC AREA: COMPARISON OF PSYCHOLOGICAL SYMPTOMATOLOGY ACCORDING TO THE BRIEF SYMPTOM INDEX IN WOMEN AND MEAN ABOARD NAVY SHIPS, AND COMPARISON WITH ARMY DATA ON PERSONNEL DEPLOYED DURING OPERATIONS DESERT SHIELD AND DESERT STORM

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ABSTRACT

This report describes the results of administration of the Brief Symptom Inventory (BSI) aboard U.S. Navy ships as a part of the US. Navy Women Aboard Ships Study. The BSI is a standardized instrument that measures psychological symptoms such as anxiety, depression, and hostility. It was administered to a 20% probability sample of women aboard 22 US. Navy ships during 1994-1995 and a comparison group of men, matched to the women on ship, work division, department, race (white, black, Hispanic, or other), pay grade, occupational rating, and date of birth. Overall, women scored significantly higher than men on depression ($p < .05$), interpersonal sensitivity ($p < .001$), psychological trauma ($p < .01$) subscales, and on an index of general severity of psychological symptoms ($p < .05$). Women who had never deployed had significantly higher scores than men who had not deployed on anxiety ($p < .05$), depression ($p < .01$), interpersonal sensitivity ($p < .001$), somatization ($p < .01$), psychological trauma ($p < .01$), and general severity of symptoms ($p < .05$). By contrast, women who had previously deployed did not differ significantly from men who had previously deployed on any subscale or index. An exception to this was women with a history of deployment to Somalia who had higher scores on the personal sensitivity subscale ($p < .05$) than men with a history of deployment there.

INTRODUCTION

The Brief Symptom Inventory (BSI) is a standardized and validated psychological inventory that measures self-reported symptoms such as anxiety, depression, and hostility [1]. The BSI was administered as part of the Comprehensive Women Aboard Navy Ships survey to a 20% probability sample of women aboard 22 U.S. Navy ships and a matched comparison group of men assigned aboard the same ships during 1994-1995.

METHODS

Population

All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1 of a longitudinal, multi-year effort, along with A comparison group of men serving aboard the same ships and matched to the women on important

characteristics. The Navy Bureau of Personnel (PERS-00W) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Fleet Medical Officers. A total of 60 Navy ships with women assigned aboard were identified as eligible for the survey based on having women crew members. There were 22 ships available for sampling during the time interval from 15 November 1994 through 30 October 1995. Availability during this interval was based primarily on ship movements. The form that included the data used in this study (Form 78) was assigned to a 20% sample of women aboard the 22 ships and an equal number of men serving aboard the same ships. Women and men enrolled in Year 1 of the study will be contacted again and re-surveyed on a 12-month cycle in Year 2.

Matching

Men were matched to women on ship, work division, department, race (white, black, Hispanic, or other), pay grade, occupational rating, and date of birth. If no individual was available in the same occupational rating, and individual with a closely related rating was selected. Matching was accomplished using the following procedures: (1) the eligible population was determined using Naval Health Research Center (NHRC) current demographic and career history file in San Diego CA, and an electronic roster was developed that included all data elements needed for matching; (2) the personnel department of each ship provided and electronic roster with limited information that was compared to the NHRC roster, and a final roster was determined; (3) a matching program was used to select the men to be included in the survey; and (4) identification labels were created and affixed to the survey packets.

Instruments

The Brief Symptom Inventory consists of nine subscales that measure symptoms of anxiety, depression, hostility, interpersonal sensitivity, obsessive-compulsive symptoms, paranoid ideation, phobic anxiety, psychotic symptoms, and somatization. It also provides an index of general severity of psychological symptoms, the general severity index (GSI), and a derived index of psychological trauma. The BSI and its subscales have been validated using populations with known psychological disorders and a normal population [1].

The GSI is an overall summary of symptom ratings and considered a general indicator of psychological distress. The Trauma Scale includes the somatization, depression and anxiety subscales. The Department of Military Psychiatry at the Walter Reed Army Institute of Research designed the Trauma Scale as a shortened version of the BSI for use in soldier surveys during Operation Desert Storm. It is included in these analyses for comparisons with the Army data.

There were of four alternate forms of the survey questionnaire. Each had an identical core of questions, followed by questions that varied according to form. The Brief Symptom Inventory was part of Form 78, which was administered to a probability sample consisting of 20% of the eligible population of women and a comparison group consisting of an equal number of men matched on important characteristics.

Comparisons With Army Data

Data collected by the Department of Military Psychiatry following Operation Desert Storm served as the comparison groups for the Navy respondents. The majority of the Army data includes male soldiers in Combat Arms units. However, a sample of female soldiers who served in combat service and support units provides preliminary comparisons with the Navy sample of females. Currently, two reports are in preparation that include larger numbers of female soldiers, as well as assessing psychological symptoms and deployment history (J. Rosen & D.Lee, Personal Communication; J. Stuart & R. Halverson, Personal Communication).

Statistical Analysis

Demographic characteristics and BSI subscale scores were analyzed according to gender and the individual's personal history of deployment. Differences in BSI scores between women and men were tested for statistical significance using two-sided *t*-tests.

Response Rates

The questionnaire was administered aboard 22 U.S. Navy ships with 3,813 women and 11,985 men assigned during 15 November 1994 through 30 October 1995. The overall median response rate was for all forms of the questionnaire was 65%. The overall median response rate for women was 67%. Participation rates for all forms of the questionnaire varied according to the number of women assigned to the ship. Ships with fewer than 100 women assigned had an overall median response rate of 75%, compared to 50% for ships with more than 100 women assigned. The form used for this analysis, Form 78, was administered to a 20% probability sample of the eligible population. The response rate for this was 59% (448/763) of eligible women and 55% (419/763) of eligible men.

RESULTS

Demographic Characteristics

There were approximately equal numbers of women and men, due to the matching procedure (Table 1). Three-quarters of the respondents were less than 31 years old (Table 2), approximately half were non-Hispanic white (Table 3), and 99% had completed high school or had a general equivalency diploma (GED) (Table 4). Most respondents were either never married (47%) or married (41%) (Table 5). More than half (58%) of the sample were in pay grades E-4 or lower (Table 6). The age distribution of the men was older than that of the women (Table 7). A slightly greater proportion of women than men were non-Hispanic Black (Table 8). A larger proportion of women than men had attended or completed some college (Table 9). Men tended to be in higher pay grades (Table 11), consistent with their slightly older age distribution (Table 7), and a larger proportion of men than women were married (Table 10).

Table 1

GENDER	Count	%
Male	419	48.3%
Female	448	51.7%
TOTAL	**867**	**100%**

Table 2

AGE	Count	%
18-25	499	58.3%
26-30	143	16.7%
31-35	128	15.0%
36-40	64	7.5%
41	22	2.6%
TOTAL	**856**	**100%**

Table 3

RACE/ETHNICITY	Count	%
White, Non-Hispanic	441	51.1%
White, Hispanic	42	4.9%
Black, Non-Hispanic	270	31.3%
Black, Hispanic	19	2.2%
Asian/Pacific Islander	39	4.5%
Native American	14	1.6%
Other Race/Ethnicity	38	4.4%
TOTAL	**863**	**100%**

Table 4

EDUCATION	Count	%
Some High School	10	1.2%
GED	30	3.5%
High School Grad	476	54.8%
Trade/Tech School	26	3.0%
Some College/AA	271	31.2%
BA/BS	43	4.9%
Graduate Degree	13	1.5%
Total	**869**	**100%**

Table 5

MARITAL STATUS	Count	%
Never Married	408	46.8%
Married	357	41.0%
Separated	50	5.7%
Divorced	55	6.3%
Widowed	1	0.1%
Total	**871**	**100%**

Table 6

PAYGRADE/RANK	Count	%
E-1	22	2.6%
E-2	95	11.0%
E-3	134	15.6%
E-4	252	29.3%
E-5	166	19.3%
E-6	135	15.7%
E-7	20	2.3%
E-8	3	0.3%
E-9	2	0.2%
O-1	6	0.7%
O-2	5	0.6%
O-3	16	1.9%
O-4	2	0.2%
O-5	2	0.2%
TOTAL	**860**	**100%**

Table 7

	MALE		FEMALE	
AGE	Count	%	Count	%
18-25	229	55.9%	268	60.5%
26-30	68	16.6%	74	16.7%
31-35	68	16.6%	60	13.5%
36-40	33	8.0%	31	7.0%
41 +	12	2.9%	10	2.3%
Total	410	100.0%	443	100.0%

Table 8

	MALE		FEMALE	
RACE/ETHNICITY	Count	%	Count	%
White, Non-Hispanic	223	53.6%	216	48.6%
White, Hispanic	26	6.3%	16	3.6%
Black, Non-Hispanic	122	29.3%	147	33.1%
Black, Hispanic	4	1.0%	15	3.4%
Asian/Pacific Islander	17	4.1%	22	5.0%
Native American	7	1.7%	7	1.6%
Other Race/Ethnicity	17	4.1%	21	4.7%
Total	416	100.0%	444	100.0%

Table 9

	MALE		FEMALE	
EDUCATION	Count	%	Count	%
Some High School	9	2.2%	1	0.2%
GED	18	4.3%	12	2.7%
High School Grad	253	60.5%	219	49.0%
Trade/Tech School	14	3.3%	12	2.7%
Some College/AA	105	25.1%	166	37.1%
BA/BS	13	3.1%	30	6.7%
Graduate Degree	6	1.4%	7	1.6%
Total	418	100.0%	447	100.0%

Table 10

	MALE		FEMALE	
MARITAL STATUS	Count	%	Count	%
Never Married	167	39.9%	238	53.1%
Married	216	51.6%	140	31.3%
Separated	20	4.8%	30	6.7%
Divorced	16	3.8%	39	8.7%
Widowed			1	0.2%
Total	419	100.0%	448	100.0%

Table 11

	MALE		FEMALE	
PAYGRADE/RANK	Count	%	Count	%
E-1	8	1.9%	14	3.2%
E-2	40	9.7%	53	12.0%
E-3	67	16.2%	67	15.2%
E-4	105	25.4%	145	32.8%
E-5	82	19.9%	84	19.0%
E-6	82	19.9%	52	11.8%
E-7	11	2.7%	9	2.0%
E-8	1	0.2%	2	0.5%
E-9	2	0.5%		
O-1	4	1.0%	2	0.5%
O-2	2	0.5%	3	0.7%
O-3	6	1.5%	10	2.3%
O-4	2	0.5%		
O-5	1	0.2%	1	0.2%
Total	413	100.0%	442	100.0%

Brief Symptom Inventory

Gender Differences - Women scored significantly higher than men on somatization, interpersonal sensitivity, and depression subscales, and on the trauma and General Severity indices (Table 12). Frequency distributions of response according to gender for all items on the BSI are shown in Appendix Table A-1.

Table 12. Comparison of Brief Symptom Inventory Subscales by Gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

MEANS	NAVY		
BSI Subscale	**Males**	**Females**	**Full Population**
Somatization	**0.2194*** **	**0.3471*** **	0.2854
Obsessive Compulsive	0.5555	0.5762	0.5662
Interpersonal Sensitivity	**0.3478*** **	**0.5908*** **	0.4733
Depression	**0.464***	**0.5577***	0.5125
Anxiety	0.3682	0.4132	0.3915
Hostility	0.7294	0.7225	0.7258
Phobic Anxiety	0.1849	0.2032	0.1944
Paranoid Ideation	0.7705	0.8864	0.8304
Psychoticism	0.4073	0.4514	0.4301
Trauma	**0.5134** **	**0.6383** **	0.5781
General Severity Index	**0.372***	**0.4347***	0.4044
Total N	409	437	846
Mean Age	26.4	25.8	26.1

$p < .05$ = *
$p < .01$ = **
$p < .001$ = ***

Deployment History - A total of 126/407 (31%) of men and 69/436 (16%) of women respondents had previously deployed to areas such as Operations Desert Shield/Desert Storm in the Persian Gulf, Somalia, Haiti, and Bangladesh. Mean scores according to gender and history of deployment on the nine subscales of the Brief Symptom Inventory are shown in Table 13 for Navy respondents the Comprehensive Women Aboard Navy Ships questionnaire and U.S. Army respondents to the Army Department of Military Psychiatry survey following the Operation Desert Shield/Storm.

Table 13. Comparison of Brief Symptom Inventory Subscales by Gender and Deployment History, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

MEANS	NAVY					ARMY				
BSI Subscale	Not Deployed		Deployed		Full Population	Not Deployed		Deployed		Full Population
	Males	Females	Males	Females		Males	Females	Males	Females	
Somatization	**0.1931*** **	**0.3645*** **	0.278	0.2547	0.2854	0.4845	0.1607	0.3268	0.4121	0.3427
Obsessive Compulsive	0.5353	0.6074	0.6005	0.4106	0.5662	0.7717	0.5625	0.5444	0.5844	0.5619
Interpersonal Sensitivity	**0.3407*** **	**0.6130*** **	0.3635	0.4722	0.4733	0.5089	1.0313	0.4037	0.545	0.4302
Depression	**0.4585***	**0.5799***	0.4762	0.4396	0.5125	0.7536	0.7083	0.4954	0.6356	0.5265
Anxiety	**0.3411***	**0.4347***	0.4283	0.2995	0.3915	0.4716	0.4583	0.3769	0.48	0.3934
Hostility	0.7258	0.744	0.7373	0.6087	0.7258	0.8085	0.875	0.7628	0.624	0.7533
Phobic Anxiety	0.1688	0.2131	0.2205	0.1507	0.1944	0.3261	0.575	0.2549	0.2967	0.2664
Paranoid Ideation	0.7672	0.8956	0.7778	0.8377	0.8304	0.7739	0.85	0.7791	0.958	0.7968
Psychoticism	0.3756	0.466	0.4774	0.3739	0.4301	0.5946	0.6313	0.447	0.5573	0.4683
Trauma	**0.4948** **	**0.6612** **	0.5547	0.5164	0.5781	0.6554	0.7454	0.5103	0.6602	0.5359
General Severity Index	**0.3583***	**0.4505***	0.4022	0.3516	0.4044	0.5213	0.5287	0.4052	0.4743	0.4743
Total N	281	367	126	69	843	46	8	644	75	773
Mean Age	25.7	25.5	28	27.3	26.1	23.2	23.4	26.4	26.1	26.4

$p < .05$ = * $p < .01$ = ** $p < .001$ = ***

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Navy women with a history of deployment did not differ from Navy men on any subscale. Women in the previous Army study did not differ significantly from men on any BSI subscale, regardless of deployment history, although the sample size of women in the Army study was 83 women compared to 436 women in the present study of women aboard Navy ships.

Comparisons of scores on the BSI according to location and phase of deployment (Operation Desert Shield, Operation Desert Storm, Somalia, or Haiti) revealed that women with a history of deployment to Somalia had a significantly higher mean score than men on the personal sensitivity subscale. Scores on other subscales did not differ markedly according to history of deployment (Table 13).

Table 14. Comparison of Brief Symptom Inventory Subscales and Deployment Location, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

Navy								
BSI Subscale	Shield		Storm		Somalia		Haiti	
	Male	Female	Male	Female	Male	Female	Male	Female
	n=73	n=37	n=69	n=33	n=41	n=27	n=25	n=10
Somatization	0.219	0.2085	0.29	0.2597	0.296	0.2593	0.36	0.4
Obsessive Compulsive	0.567	0.3378	0.547	0.3687	0.496	0.5185	0.9	0.4
Interpersonal Sensitivity	0.319	0.4617	0.367	0.5152	**0.3801***	**0.7222***	0.51	0.3
Depression	0.415	0.4279	0.469	0.4747	0.478	0.5309	0.707	0.5667
Anxiety	0.407	0.2793	0.416	0.3081	0.433	0.3086	0.48	0.35
Hostility	0.696	0.4919	0.725	0.5455	0.773	0.7037	0.82	0.76
Phobic Anxiety	0.173	0.1514	0.223	0.2	0.224	0.237	0.344	0.12
Paranoid Ideation	0.792	0.7081	0.835	0.7939	0.79	1.0148	0.888	1.06
Psychoticism	0.392	0.3892	0.446	0.3939	0.509	0.4815	0.736	0.6
Trauma	0.514	0.5015	0.545	0.5612	0.54	0.5981	0.736	0.6407
General Severity Index	0.367	0.3193	0.395	0.3592	0.402	0.4262	0.534	0.4333

$p < .05$ = *
$p < .01$ = **
$p < .001$ = ***

Comparisons of Scores On the BSI With Those in the Civilian Population - Results for Navy respondents were compared to norms for a civilian (non-patient) population (1), although the age-distribution of the population used to establish civilian norms was considerably older than that of Navy personnel in the sample. Navy women scored significantly higher than civilian women on the depression ($p < .001$), interpersonal sensitivity ($p < 0.001$), hostility ($p < .001$), obsessive-compulsive symptoms ($p < .05$) (data not shown). Navy men scored significantly higher than civilian men on anxiety, depression, hostility, interpersonal sensitivity, obsessive-compulsive symptoms, paranoid ideation, phobic anxiety, psychoticism, and a general severity index, possibly reflecting the considerable age difference between the Navy sample and the population used to establish the civilian norms (data not shown).

DISCUSSION

Normative Data

Respondents on the BSI numbered more than 800, establishing a preliminary normative data base of psychological symptom reports for Navy personnel to be augmented in the future. Correspondingly, the Army data base continues to grow and some initial comparisons are relevant to this study. In addition, the BSI manual (Derogatis,1993) reports non-military norms. These include more than 700 subjects as well as a gender breakdown. However, as was the case for Army soldiers, symptom reports for Navy respondents are consistently higher than the non-military norms, raising the question of valid comparison across the populations. In particular, the vastly different mean ages of the groups (Civilian non-patients' mean age = 46 years; Army and Navy respondents' mean age = 26 years) may present a problem in interpreting the results. Additional normative data collected from non-military as well as military populations may clarify the findings.

Given the caveats regarding the civilian norms, the comparative focus for the Navy data shifted to Army survey data collected following Operation Desert Storm. There were notable similarities in demographic profiles, as well as in military experience, for the service members of both populations. Although analysis continues for subsequent Army data sets containing additional female soldiers, preliminary comparisons reveal very few gender differences when previous deployment experience and location are controlled.

Interestingly, Navy respondents with no deployment experience show the greatest gender differences. Navy females without a deployment history report significantly higher mean scores on four BSI subscales when compared to their male counterparts. However, the mean subscale ratings for this sample tend to be lower than those of soldiers with no deployment experience, and lower than Army and Navy respondents who have deployed in the past. The Navy sample without deployment experience is also somewhat younger than the Army and Navy samples with a history of deployment.

Risk Status

Do the gender differences in symptom ratings increase risk? Overall, mean symptom ratings and subscale scores across samples are relatively low. Implications for the gender differences may emerge when additional analyses relate psychological symptom reports to physical symptoms, sick call visits, current life stress ratings, and other performance indicators. Additionally, the sample may include "outliers", those who respond in the highest BSI rating categories. This recalls the BSI item breakdown by rating frequency and the small percentage of respondents in the "Extreme" category. Further analysis may help determine whether this is a response style tendency or psychological distress with corresponding elevated risk. For example, determination of risk should include performance indicators to assess adaptation, as well as longitudinal follow-up of high and low symptom response groups. Currently there is no evidence that respondents reporting elevated symptoms are demonstrating problem behaviors or poor adaptation.

Greater control of demographic variables and sample experiences lessens the effect of gender on symptom ratings. The highest similarities in symptom rating patterns occur for males and females who deployed to the same location. This is not to say that the ratings are low, only that they are similar. Consideration of symptom profiles may contribute to the determination of risk status that cuts across gender.

Prospective Data

Additional pattern or profile analysis of BSI symptoms may highlight findings for longitudinal follow-up. Results of the preliminary item analysis indicate that females report a different pattern of symptoms than the total sample of respondents and than their male counterparts. The pattern of depressive symptoms, although not endorsed by a large percentage of females, is notable within the data set. It is unclear whether a group of "outliers" is responsible for this pattern, and/or whether it is a situational response indirectly related to gender. For example, the reaction could be in response to conditions aboard a particular ship, or within particular sections, or with particular leaders.

Correspondingly, the items endorsed by at least half of respondents indicate a fairly high percent symptomatic across the sample. The items include feeling tense, easily annoyed, worrying too much, feeling low in energy, and feeling that people cannot be trusted. The range of response is "A little bit" to "Extreme" with most responses falling in the lower range. The ranking pattern for these items is similar for male and female respondents. Additional analysis will focus on other situational variables that may be affecting these response rates. Comparisons with Army data sets in this regard may determine whether the items have corresponding ratings in other military samples. Related to this possibility are the effects of work-related stress and whether particular types of jobs contribute to the outcomes. The value of baseline symptom rates is in their usefulness in assessing the effects of future change.

CONCLUSION

The analysis plan for the self-reported symptom inventory and deployment history sections of survey 7/8 proposes three inter-related areas. The first area develops gender based norms for Navy service members. Comparisons with Army survey data collected following Operation Desert Storm and the non-military norms reported in the symptom inventory's manual (Derogatis, 1993) address differences in these populations. Primary attention is on gender differences with control of other demographic variables. Overall mean psychological symptom ratings and subscale scores for Navy respondents are relatively low and comparable to findings for Army respondents.

The second area of analysis concerns risk status by examining BSI subscale and GSI mean scores. Symptom reports on the BSI classify respondents into high or low risk with follow-up to address physical symptoms, sick call visits and diagnoses, and other relevant performance and adaptation indicators. Respondents' past deployment history may relate to risk status, either by conferring a measure of protection through experience, or by increasing vulnerability through previous traumatic exposure. The prospective focus recommended for the third area of analysis relates directly to risk status. The current data base forms the initial phase of study. Longitudinal follow-up of high and low symptom response groups can determine the effects of elevated psychological symptoms or symptom patterns on adaptation to onboard ship duty for both males and females.

The three areas of analysis overlap. The process of organizing the symptom inventory data proceeded from overall sample and gender comparisons on item response frequencies to subscale mean comparisons. Additional comparisons with civilian and Army norms followed. The respondents' previous history of deployment further divided the samples, with corresponding attempts to determine whether such experiences affect symptom reports and risk status. Finally, the deployment location was held constant and comparisons made between male and female respondents. The differences found between groups, whether gender or previous deployment related, indicate the need for follow-up .

Notes:

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Appendix A-1. Brief Symptom Index Response Frequency by Gender

BSI Items	None				A Little Bit				Moderate				Quite A Bit				Extreme			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Nervousness or shakiness inside	296	72.7%	321	73.5%	65	16.0%	68	15.6%	29	7.1%	26	5.9%	15	3.7%	15	3.4%	2	0.5%	7	1.6%
Repeated unpleasant thoughts	213	52.2%	226	51.7%	83	20.3%	103	23.6%	56	13.7%	44	10.1%	42	10.3%	47	10.8%	14	3.4%	17	3.9%
Faintness or dizziness	370	90.9%	357	82.1%	23	5.7%	41	9.4%	9	2.2%	20	4.6%	3	0.7%	13	3.0%	2	0.5%	4	0.9%
Loss of sexual interest or pleasure	325	79.7%	318	73.6%	41	10.0%	47	10.9%	27	6.6%	26	6.0%	11	2.7%	25	5.8%	4	1.0%	16	3.7%
Feeling critical of others	226	55.9%	216	50.1%	86	21.3%	100	23.2%	66	16.3%	67	15.5%	19	4.7%	39	9.0%	7	1.7%	9	2.1%
The idea that someone else can control your thoughts	326	79.9%	340	77.8%	31	7.6%	36	8.2%	22	5.4%	28	6.4%	17	4.2%	26	5.9%	12	2.9%	7	1.6%
Feeling others are to blame for most of your troubles	291	71.3%	333	76.4%	62	15.2%	66	15.1%	23	5.6%	23	5.3%	20	4.9%	10	2.3%	12	2.9%	4	0.9%
Trouble remembering things	248	60.8%	275	63.1%	83	20.3%	88	20.2%	49	12.0%	36	8.3%	20	4.9%	27	6.2%	8	2.0%	10	2.3%
Feeling easily annoyed or irritated	163	40.0%	123	28.2%	100	24.5%	117	26.8%	67	16.4%	74	17.0%	52	12.7%	79	18.1%	26	6.4%	43	9.9%
Pains in heart or chest	353	86.5%	359	82.3%	25	6.1%	39	8.9%	24	5.9%	24	5.5%	2	0.5%	8	1.8%	4	1.0%	6	1.4%
Feeling afraid in open spaces	392	96.1%	416	95.4%	8	2.0%	14	3.2%	6	1.5%	3	0.7%			1	0.2%	2	0.5%	2	0.5%
Feeling low in energy or slowed down	217	53.2%	190	43.5%	103	25.2%	107	24.5%	47	11.5%	58	13.3%	33	8.1%	57	13.0%	8	2.0%	25	5.7%
Thoughts of ending your life	377	92.4%	408	93.8%	17	4.2%	15	3.4%	5	1.2%	4	0.9%	4	1.0%	5	1.1%	5	1.2%	3	0.7%
Feeling that most people cannot be trusted	215	52.7%	183	42.0%	84	20.6%	92	21.1%	51	12.5%	56	12.8%	26	6.4%	56	12.8%	32	7.8%	49	11.2%
Poor appetite	314	77.1%	291	66.6%	55	13.5%	69	15.8%	23	5.7%	36	8.2%	8	2.0%	32	7.3%	7	1.7%	9	2.1%
Crying easily	376	92.2%	284	65.0%	15	3.7%	72	16.5%	12	2.9%	33	7.6%	1	0.2%	27	6.2%	4	1.0%	21	4.8%
Suddenly scared for no reason	382	93.6%	375	85.8%	12	2.9%	42	9.6%	9	2.2%	12	2.7%	2	0.5%	3	0.7%	3	0.7%	5	1.1%

BSI Items	None				A Little Bit				Moderate				Quite A Bit				Extreme			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Temper outbursts that you could not control	305	74.8%	315	72.1%	43	10.5%	56	12.8%	29	7.1%	38	8.7%	19	4.7%	18	4.1%	12	2.9%	10	2.3%
Feeling lonely even when you are with people	269	65.9%	276	63.2%	72	17.6%	74	16.9%	33	8.1%	37	8.5%	24	5.9%	28	6.4%	10	2.5%	22	5.0%
Feeling blue	260	63.7%	236	54.1%	81	19.9%	116	26.6%	39	9.6%	28	6.4%	16	3.9%	33	7.6%	12	2.9%	23	5.3%
Worrying too much about things	142	34.7%	98	22.4%	122	29.8%	138	31.6%	81	19.8%	91	20.8%	45	11.0%	73	16.7%	19	4.6%	37	8.5%
Feeling no interest in things	239	58.6%	259	59.3%	91	22.3%	84	19.2%	54	13.2%	50	11.4%	16	3.9%	30	6.9%	8	2.0%	14	3.2%
Feeling fearful	327	81.5%	348	80.0%	52	13.0%	55	12.6%	15	3.7%	20	4.6%	5	1.2%	4	0.9%	2	0.5%	8	1.8%
Your feelings are easily hurt	313	76.9%	235	54.3%	54	13.3%	97	22.4%	29	7.1%	44	10.2%	6	1.5%	35	8.1%	5	1.2%	22	5.1%
Feeling inferior to others	345	84.6%	343	78.5%	41	10.0%	51	11.7%	15	3.7%	26	5.9%	4	1.0%	13	3.0%	3	0.7%	4	0.9%
Nausea or upset stomach	342	83.8%	311	71.2%	41	10.0%	70	16.0%	17	4.2%	31	7.1%	3	0.7%	17	3.9%	5	1.2%	8	1.8%
Feeling that you are watched or talked about by others	281	68.9%	244	55.8%	71	17.4%	95	21.7%	25	6.1%	49	11.2%	17	4.2%	27	6.2%	14	3.4%	22	5.0%
Trouble falling asleep	275	67.2%	249	57.0%	69	16.9%	92	21.1%	31	7.6%	43	9.8%	18	4.4%	30	6.9%	16	3.9%	23	15.3%
Having to check and double-check what you do	263	64.3%	282	64.5%	83	20.3%	83	19.0%	45	11.0%	38	8.7%	12	2.9%	23	5.3%	6	1.5%	11	2.5%
Difficulty making decisions	282	69.1%	300	68.8%	77	18.9%	78	17.9%	32	7.8%	36	8.3%	9	2.2%	16	3.7%	8	2.0%	6	1.4%
Feeling afraid to travel	380	93.1%	402	92.2%	19	4.7%	22	5.0%	7	1.7%	6	1.4%			4	0.9%	2	0.5%	2	0.5%
Trouble getting your breath	372	91.0%	375	86.0%	21	5.1%	35	8.0%	9	2.2%	13	3.0%	5	1.2%	10	2.3%	2	0.5%	3	0.7%
Hot or cold spells	382	93.4%	381	87.2%	17	4.2%	35	8.0%	8	2.0%	12	2.7%	1	0.2%	7	1.6%	1	0.2%	2	0.5%
Having to avoid certain things because they frighten you	379	92.7%	388	89.0%	15	3.7%	25	5.7%	11	2.7%	12	2.8%	2	0.5%	7	1.6%	2	0.5%	4	0.9%

BSI Items	None				A Little Bit				Moderate				Quite A Bit				Extreme			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Your mind going blank	321	79.1%	337	77.5%	55	13.5%	65	14.9%	19	4.7%	19	4.4%	9	2.2%	7	1.6%	2	0.5%	7	1.6%
Numbness or tingling in parts of your body	345	84.6%	353	81.0%	44	10.8%	52	11.9%	10	2.5%	16	3.7%	2	0.5%	8	1.8%	7	1.7%	7	1.6%
The idea that you should be punished for your sins	351	86.2%	369	84.4%	32	7.9%	38	8.7%	17	4.2%	11	2.5%	2	0.5%	12	2.7%	5	1.2%	7	1.6%
Feeling weak in parts of your body	295	72.3%	279	64.0%	72	17.6%	95	21.8%	31	7.6%	42	9.6%	5	1.2%	14	3.2%	5	1.2%	6	1.4%
Feeling tense or keyed up	217	53.3%	208	47.6%	83	20.4%	100	22.9%	68	16.7%	73	16.7%	32	7.9%	38	8.7%	7	1.7%	18	4.1%
Thoughts of death or dying	326	80.3%	374	85.8%	43	10.6%	31	7.1%	20	4.9%	16	3.7%	10	2.5%	10	2.3%	7	1.7%	5	1.1%
Having urges to beat, injure or harm someone	247	61.3%	316	72.6%	68	16.9%	53	12.2%	43	10.7%	27	6.2%	23	5.7%	22	5.1%	22	5.5%	17	3.9%
Sleep that is restless or disturbed	258	63.4%	231	52.9%	73	17.9%	98	22.4%	46	11.3%	53	12.1%	16	3.9%	34	7.8%	14	3.4%	21	4.8%
Having urges to break or smash things	275	67.7%	334	76.8%	54	13.3%	51	11.7%	31	7.6%	18	4.1%	29	7.1%	21	4.8%	17	4.2%	11	2.5%
Feeling very self-conscious with others	305	75.1%	295	67.8%	63	15.5%	85	19.5%	24	5.9%	30	6.9%	7	1.7%	17	3.9%	7	1.7%	8	1.8%
Feeling uneasy in crowds	295	72.5%	337	77.1%	55	13.5%	57	13.0%	32	7.9%	18	4.1%	15	3.7%	18	4.1%	10	2.5%	7	1.6%
Never feeling close to another person	302	74.2%	315	72.2%	51	12.5%	63	14.4%	28	6.9%	33	7.6%	18	4.4%	20	4.6%	8	2.0%	5	1.1%
Spells of terror or panic	377	92.6%	404	92.7%	18	4.4%	19	4.4%	6	1.5%	6	1.4%	4	1.0%	2	0.5%	2	0.5%	5	1.1%
Getting into frequent arguments	288	70.8%	302	69.3%	60	14.7%	78	17.9%	40	9.8%	25	5.7%	9	2.2%	18	4.1%	10	2.5%	13	3.0%
Feeling nervous when your are alone	374	92.3%	384	88.5%	19	4.7%	24	5.5%	7	1.7%	13	3.0%	2	0.5%	5	1.2%	3	0.7%	8	1.8%
Others not giving you proper credit for your	222	54.7%	234	53.9%	71	17.5%	82	18.9%	57	14.0%	59	13.6%	32	7.9%	38	8.8%	24	5.9%	21	4.8%
Feeling so restless you couldn't sit still	300	73.7%	333	76.7%	70	17.2%	54	12.4%	16	3.9%	32	7.4%	14	3.4%	10	2.3%	7	1.7%	5	1.2%

BSI Items	None				A Little Bit				Moderate				Quite A Bit				Extreme			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Feeling of worthlessness	333	82.2%	351	80.9%	42	10.4%	46	10.6%	22	5.4%	18	4.1%	5	1.2%	8	1.8%	3	0.7%	11	2.5%
Feeling people will take advantage of you if you let	221	54.3%	215	49.5%	83	20.4%	97	22.4%	54	13.3%	53	12.2%	31	7.6%	32	7.4%	18	4.4%	37	8.5%
Thoughts and images of a frightening nature	356	87.5%	380	87.4%	32	7.9%	29	6.7%	10	2.5%	14	3.2%	7	1.7%	7	1.6%	2	0.5%	5	1.1%
Feelings of guilt	305	74.9%	330	76.0%	68	16.7%	65	15.0%	18	4.4%	17	3.9%	9	2.2%	11	2.5%	7	1.7%	11	2.5%
The idea that something is wrong with your mind	334	82.7%	363	84.0%	39	9.7%	36	8.3%	18	4.5%	12	2.8%	8	2.0%	13	3.0%	5	1.2%	8	1.9%

APPENDIX G.9

Exploration of Stress Differences by Gender Aboard U.S. Navy Ships

Ross R. Vickers, Jr., Ph.D. and James A. Martin, Ph.D., BCD

REPORT TOPIC AREA: EXPLORATION OF STRESS DIFFERENCES BY GENDER ABOARD U.S. NAVY SHIPS

LEAD AUTHORS: Ross R. Vickers, Jr., Ph.D., and James A. Martin, Ph.D., BCD

ABSTRACT

Recent U.S. Navy policy has assigned more women to shipboard duty. If women experience or react to shipboard duty differently than men, then shipboard stress levels should vary according to gender ratio. This paper addresses two indicators of shipboard stress. First, is the structure of perceived stress the same for both genders? Second, are the emotional consequences of stress the same for both genders? A negative answer to the first question would indicate the presence of beta gender differences in stress. A negative answer to the second question would indicate the presence of gamma differences in stress. Structural modeling indicated the following: (a) Stress could best be represented by a 3-dimensional model comprising general life stress dimension, a shipboard living conditions dimension, and a job stress dimension; (b) Only overall life stress was related to distress; (c) There were no significant differences between women and men on these dimensions. The results indicated that neither beta nor gamma differences were present. This outcome simplifies the study of shipboard stress by indicating that as few as three dimensions can summarize a wide variety of specific stressful conditions and that the same stress model can be applied to women and men. The results also raise important questions to direct future investigation, e.g., does the general stress dimension reflect the effects of attributes of the person (e.g., personality) or differences in career factors (e.g., occupational specialty). Another important question is whether living conditions and job stresses have effects on variables which were not measured in this study (e.g., reenlistment rates, performance ratings). The present study provides measurement models that can be used to compare levels of stress between women and men aboard ship and to test the hypotheses about the sources and consequences of those stresses. While additional studies should be sensitive to the possibility that women and men differ in reactions to stress that were not investigated in this study, the results to this time suggest that a single stress model applies to both genders.

INTRODUCTION

Background

Recent policy changes have increased the number of women serving aboard U.S. Navy ships. Shipboard service has always involved stresses ranging from family separation to living in cramped spaces to coping with shifting watch schedules, and a host of other factors. The increased number of women on ships raises questions about the stress profile. Will this policy change the type, frequency, or consequences of shipboard stress? This paper addresses a fundamental issue that must be resolved to provide meaningful answers to these questions. Are

the stress perceptions and responses of women assigned to shipboard duty comparable to those of their male shipmates?

The answer to the preceding question is important for both scientific and practical reasons. If a single measurement model applies to both genders, a single stress model may apply to both genders. Studies of women, men, and mixed gender groups then can be combined to provide a single overall understanding of shipboard stress.

The situation is more complex if men and women require separate stress models. This finding would imply that stresses have different causes and/or consequences for women and men. In fact, finding that distinct models applied to women and men would mean that even simple comparisons, such as determining which gender reported a higher average level of stress, would not be meaningful scientifically.

Stress differences between women and men aboard ship would have practical implications as well. The practical consequence of finding that different models apply to women and men would be that the two genders would have to be treated differently to reduce stress and/or its effects. Dealing with the complexities of large, technologically sophisticated man-machine systems is a challenging problem even without the considering stress on the humans in the system. If men and women must be treated in different ways to reduce stress and achieve effective performance, the problems become even more complex.

The scientific and practical problems sketched in the preceding paragraphs only arise if there are real gender differences in stress. It is important, therefore, to determine the true state of affairs rather than simply assuming that differences do or do not exist. The present paper reports the results of systematic empirical evaluations undertaken to test for gender differences in the structure and meaning of shipboard stress.

Conceptual Approach

This study examines two of three possible ways in which the stresses of women could differ from those of men. The three possible differences are summarized succinctly in Golembiewski, Billingsley, and Yeager's [1] model of alpha-beta-gamma change. This model was generated to provide a more complete representation of the possible effects of organizational development interventions.

Alpha change refers to differences in the mean level of indicator variables when those variables are measured before introducing an intervention, then after the intervention. The differences computed to estimate alpha change are meaningful only if the measurements taken prior to the intervention measure the same thing after the intervention. If not, difference scores can be computed, but the resulting number is akin to comparing apples and oranges.

Alpha change cannot be validly interpreted in the presence of either beta or gamma differences, both of which are discussed in the following paragraphs. Beta or gamma change imply changes in causal network for the indicators used to estimate alpha change. Changes in either the antecedents or consequences of stress, for example, would alter the meaning of stress scores. Under current professional guidelines for developing valid psychological tests, beta and/or gamma change would alter the validity of test scores [2] and would turn tests for alpha change into apples-oranges comparisons. Tests for alpha change are meaningful only if it can be demonstrated that beta and gamma change have not occurred.

This paper addresses beta and gamma aspects of stress. Beta change refers to changes in the internal structure of measured variables [1]. From a psychometric perspective, gamma changes imply that the underlying psychosocial processes giving rise to the observed behaviors or indicators being used to measure a construct have changed. Given that indicators are chosen to measure underlying causal factors (commonly referred to as latent traits in the technical literature [3]), the psychometric inference from this structural change is that what is measured has changed.

Gamma change alters the pattern of relationships to other variables. Under current professional guidelines, patterns of association to other variables provide the basis for interpreting test scores [2]. This point is important because the validity of inferences drawn from test scores is determined by whether the proposed interpretation of the scores is appropriate and/or useful. Gamma changes which alter the pattern of external associations should alter the inferences or interpretations that can be made based on scale scores. For example, suppose that prior to a therapeutic intervention, a stressor caused substantial distress in a person or population. The intervention changes the way people react to the stress (e.g., by providing a drug to blunt the response, by reinterpreting the stress as a positive opportunity, etc.). People who undergo the therapy still may report the same level of stress after therapy (i.e., the situation has not changed), but the inferences that could be drawn based on those reports (i.e., the meaning of the scores) would be altered because the consequences of what is reported have changed. In the hypothetical example, it would be inappropriate to interpret a high score as implying distress after therapy. The meaning of a high score on the stressor has changed because the pattern of association to other variables has changed. Technically, the validity of the scores has changed [2].

The key point in the preceding examples is that alpha changes along a stress dimension or any other psychological dimension can only be interpreted if beta and gamma changes are not present. Beta and gamma change must be investigated to ensure valid interpretations of test scores. If beta or gamma change occurs, the interpretive context for test scores changes, thereby altering the validity of inferences drawn from the scores [2].

Application to Gender Differences

The alpha-beta-gamma conceptual framework applies to the study of gender differences. This application is a natural extension, because change concepts generalize logically to studies of differences. One view of gender differences is that these differences, where they exist, are the product of different "interventions" for different entities. The interventions can be biological and/or social in origin. Female-male differences in biology and socialization affect the developmental processes that give rise to growth curves when serial measurements are taken. Measures taken at two or more points in the growth curves would yield difference scores that would be change scores in longitudinal research [4]. If two groups with different growth curves are compared at the same chronological point in their development, the groups will differ (unless the comparison hits a crossover point in the curve). Between-group differences therefore can be seen as the product of between-group differences in cumulative within-group change processes (i.e., growth curves). For this reason, the points derived above from the alpha-beta-gamma analysis of change also can be applied to analyses of group differences.

The Golembiewski et al. (1) model implies that gender differences can be either alpha, beta, or gamma differences. Alpha differences would be present to if men and women differed with respect to the mean levels of stressors (i.e., specific events or conditions affecting the individual which may occasion negative reactions in at least some people) and distress (i.e., emotional or evaluative responses to stressors). Alpha differences are frequently studied without considering possible beta or gamma differences. This practice is inappropriate if beta or gamma differences are present [5]. For the reasons addressed in the previous consideration of change, alpha differences can only be given valid interpretations if beta and gamma differences are absent.

Beta gender differences exist if the internal structure of stress or distress is different for men and women. Such differences could arise from differential treatment of women and men, but beta differences also could occur even if men and women were exposed to similar objective situations. The latter situation would arise if men and women encode identical situations differently. Differences in the socialization and/or biology of men and women may result in differences in encoding. However, neither the existence nor the structure of those differences should be assumed for the purposes of systematic study of the topic. These differences, if they exist, would mean that distinct causal processes were at work in females and males. As a consequence, stress indicators would have different meanings for men and women.

Gamma gender differences exist if men and women react differently to the same perceived stressors. For example, if women were more emotional and men more stoic, some theories would predict that women would respond to stress with anxiety, depression, or other similar reactions, while men would be more likely to develop psychosomatic disorders as the mode of response [6]. The meaning of stress clearly would be different for the two genders unless one wishes to equate emotional discomfort with risk of cancer or coronary disease. Thus, it is important to determine

not only whether women and men demonstrate the same internal structure for stress, but whether the consequences of that stress are the same for both genders.

Application to Shipboard Stress

Alpha, beta, and gamma gender differences in shipboard stress all are important if they exist. However, it is uncertain at present what types of differences, if any, can be expected in female and male sailors aboard ship. Common stereotypes would suggest that stress will increase. Behaviors that are acceptable in a single-gender crew may produce more stress in a mixed-gender crew (e.g., due to sexual harassment). Standard practices may cause different patterns of stressors for women than for men (e.g., the stressfulness of deployment or rotating watch schedules would be expected to be greater for women to the degree that they have a greater role in the standard arrangements for providing child care). Even if the stress level does not change, existing stresses will have a different impact on crew morale and health if women's emotional responses to stress differ from those of men. In the order given, these three examples illustrate how adding women to the previously all-male domain of shipboard life could yield alpha, beta, and gamma changes in shipboard stress.

The stereotyped representation of the effects of introducing women into a ship's crew sketched above was introduced to make two points. First, each type of effect must be investigated systematically. Failure to consider any of the three types of differences could distort the overall evaluation of the impact of putting women aboard ship. Second, stereotypes may suggest increased stress and stress effects, but stereotypes often err. Each stereotypical hypothesis suggested above can be countered by plausible alternative that predict a reduction in stress from adding women to a ship's crew. Women's past social roles (e.g., a married woman having to coordinate household activities while holding down a job during a spouse's deployment) may give women broader experience in dealing with the vagaries of unpredictable, irregular, conflicting schedules. Women's interpersonal styles may differ from men's in ways that help reduce friction on the job. Women may react emotionally to the job, but not with illness as indicated by surveys indicating that women are less likely to lose time from work for health reasons.

While specific hypotheses about the expected nature of gender differences in shipboard stress are desirable, such formulations probably are premature. As demonstrated above, logical analysis can lead to conflicting hypotheses. Prior research, the other obvious source of hypotheses, is likely to be a poor guide to what can be expected aboard ship. Past studies in non-military settings have limited applicability, because women and men often occupy distinct social environments. Even military studies may have limited applicability, because of shipboard living provides a unique physical setting which may have peculiarities that are present in few, if any, other living situations. Indeed, one interesting aspect of the current study is that men and women face a similar and very constrained set of social and working conditions aboard ship. Thus, if social structural factors affect stress and the reactions to stress in men and women in other settings, those differences may disappear aboard ship. As a consequence, a priori predictions

about female-male differences are made difficult not only by the range of plausible hypotheses, but by the uncertainty of generalizing from other settings with different social structural constraints to the shipboard setting. Even prior military research may be misleading, given that women's career opportunities have been limited by policies that precluded sea duty while not having to face the problems of leaving their families to go to sea. The simplest approach to understanding gender differences in shipboard stress, therefore, is to treat the situation as a "whole new ball game" and approach it with a minimum of preconceptions and assumptions.

Scope of the Present Study

The introduction of women aboard ship will change the overall patterns and consequences of shipboard stress if women and men have different experiences aboard ship and/or if women and men differ in either their perception of or reaction to those experiences. The points made in the preceding paragraphs illustrate that explicit hypotheses about the nature of the differences between women and men may be inappropriate at this time, because so many plausible competing alternatives exist. However, the examples given should make it clear that all three types of difference could occur and must be investigated. Furthermore, the study of beta and gamma change logically precedes studies of alpha differences, because alpha differences are interpretable only if beta and gamma differences are absent. While all three possible differences ultimately must be examined to fully understand the impact of a mixed gender crew on shipboard stress, its antecedents, and its sequelae, the present paper applying the Golembiewski et al. (1) concepts of model beta and gamma change to the assessment of gender differences in stress for male and female sailors assigned to shipboard duty. The working null hypothesis is that no differences between men and women will be identified the level, type, and impact of shipboard stresses.

METHODS

General Research Design

This study is part of the Women Aboard Navy Ships Comprehensive Health and Readiness Research Project conducted at the Naval Health Research Center in San Diego, California as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. This epidemiologic research project utilizes several data collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important characteristics. The study has a longitudinal design with women and men enrolled in Year 1 of the study being contacted again and re-surveyed on a 12-month cycle in Year 2. All women reporting aboard ship (and matched men) in Year 2 also will be enrolled. This is a report of Year 1 survey results, based on 9 months of data collection.

Population. All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1. An equal number of men serving aboard ship matched

on relevant characteristics were also eligible. The Navy Bureau of Personnel (PERS-OOW) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were determined to be eligible for inclusion in the study.

This report is based on the first 22 ships surveyed. These ships were surveyed based on availability as determined by the Commanding Officer and Medical Department of each ship. The ships surveyed included the U.S.S.: Barry, Camden, Cape Cod, Comstock, Coronado, Curtis Wilbur, Dixon, Emory S. Land, Grapple, Grasp, Holland, Kiska, L.Y. Spear, Monongahela, Mount Baker, Mount Hood, Platte, Rainier, Santa Barbara, Shenandoah, Supply, and Yellowstone (Appendix Table 1). These 22 ships had 3,813 women and 11,985 men assigned aboard.

Matching. The men aboard ship included in this study were matched to women on the following characteristics: ship, work division, department, race (white, black, Hispanic, and other), pay grade (E1-E3, E4-E6, E7-E9, O1-O3, O4-O6), rating (if no individual was available in the same rating, an individual with a closely related rating was selected), and date of birth (nearest date of birth, not to exceed plus or minus two years). In the infrequent instances where these criteria could not be met, men that matched as closely as possible to women were selected.

The selection of the matched men for study was accomplished as follows: (1) the eligible population was determined using NHRC files, and an electronic roster was developed which included all data elements needed for matching; (2) the personnel department of each ship provided an electronic roster with limited information which was compared to the NHRC roster, and a final roster was determined; (3) a matching program was run to select the men to be included in the survey; and (4) individual identification labels were created and affixed to survey packets.

Survey Development. Several methods were used for the development of the U.S. Navy Shipboard Health Survey used in this study, including the following: (1) review of extant questionnaires, literature, and standard scales, (2) convening of a panel of subject matter experts, (3) elicitation of major issues from knowledgeable sources, and (4) review of Navy requirements concerning the reporting of women's health and access to health care.

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities [7,8] were reviewed and adopted for use in this study. The questionnaires developed by the CDC included the National Health Interview Survey [9], the Health Interview Survey Form HIS-1(1992) and HIS-2(1992) [10,11], the National Ambulatory Health Care Survey for 1994, 1995, and 1996 [12], and the Youth Behavior Survey [13]. Previous questionnaires developed by the Naval Health Research Center also were reviewed, and ranged from nutrition surveys to patient care surveys. In addition, a series of scales and inventories were reviewed and selected for use. These standard scales included but were not limited to: Center for Epidemiological Studies Depression

Scale (CES-D) (14), a scale which measures the current frequency of depressive symptoms, and the Quality of Life Scale (15), a four-item scale previously used in research on Navy populations.

Survey Administration. The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign informed consent and to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all study subjects to remain in one area, surveys were distributed, and the participants were allowed to fill them out in work spaces. The completed surveys were collected by study staff in sealed envelopes in all cases.

Response Rates. The median ship response rate for the 22 ships was 65.1%, and the mean response rate was 56.5%. The median response rate for women was 67.4%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had a median response rate of 74.7% while ships with more than 100 women assigned had a median response rate of 49.6%.

Stress Study Design

Sample. The sample of sailors drawn from the ships receiving the questionnaire forms that included the stress measures consisted of 1,046 women and 1,066 men. The matching procedures were effective despite some nonparticipation. Average age was comparable across genders (Women, mean = 26.3, SD = 6.1; Men, mean = 26.6, SD = 6.4). Matching clearly produced male and female samples of comparable ethnic composition (chi-square = 4.83, 6 df, $p < .566$). The predominant ethnic groups were non-Hispanic whites (51.4%) and non-Hispanic Blacks (30.3%). Other ethnic groups accounting for more than 1% of the total sample included Hispanic whites (5.5%), Asians/Pacific Islanders (4.1%), Hispanic Blacks (2.2%), and Native Americans (1.3%). The remaining 5.2% of the sample listed some "other" race/ethnicity.

Pay grade/rank differed between men and women when all levels were considered (chi-square = 29.64, 11 df, p , .002), but the difference was concentrated largely at the E-6 Pay grade. Men were much more likely to have a rank of E-6 than were women (16.6% versus 11.1%). This difference produced a significant chi-square for the E-6 Pay grade (chi-square = 11.46, 1 df, $p < .001$). Removing the E-6 Pay grade from the comparisons, the remaining Pay grade/rank levels did not differ significantly between women and men (chi-square = 16.05, 10 df, $p < .099$).

Women and men in the sample did differ on some important demographic variables which were not part of the matching procedures. Significant differences were noted for education (chi-square = 60.38, 6 df, $p < .001$) and for marital status (chi-square = 63.07, 2 df, $p < .001$). Examination of the differences showed that women tended to be more educated with as 45.7% having at least some college education compared to 33.0% of men. Women were roughly twice

as likely as men to be separated/divorced/widowed (16.1% versus 8.7%). Women also were more likely to be single (48.9% versus 40.4%). Since people not falling in these two broad marital categories all were married, men were more likely to be married (50.9% versus 35.0%).

Stress Measures. The stress measure was a 33-item questionnaire developed for the study (Appendix A). Items emphasized stresses associated with shipboard life (e.g., crowding, privacy, recreation), the job (i.e., supervisor, peer, subordinate interactions), Navy career opportunities (e.g., promotion opportunities, prospects for continuing in U.S. Navy career). Other items dealt with topics that would be commonplace concerns for people in general (e.g., health, finances, family, breaking up with a special friend).

The response format for the stress items included five scored options. The scored options ranged from "None at all (1)" to "Extreme amount (5). A response option of "Not applicable (9)" was provided, but was treated as missing data when used.

Three items concerning stresses associated with children were omitted from the analyses because many respondents did not have children. The intent for this paper was to examine stresses that were potential problems for all personnel, thereby defining stress dimensions which applied as widely as possible within the U.S. Navy population being studied. The resulting measurement and conceptual framework then will provide a frame of reference for additional studies which will elaborate on this basic model by adding elements and/or by examining the stability of the measurement structures across different sociodemographic groups. Family status is a high priority sociodemographic variable for further study, but the inclusion of the family items in this initial evaluation of the structure of stress would have added a large number of correlations derived from just a subset of the population. The resulting measurement structure, therefore, might be strongly affected by the subset of the population with families. This influence would be felt even though a decision was made to utilize pairwise missing data in the analyses (see Matrices Analyzed below). Without this decision, the analyses would have been restricted to people who answered all the questions, including the family questions and, therefore, would have been based solely on sailors with families. Even with pairwise deletion, the retention of family items would have permitted sailors with families substantial influence over the final measurement structure. This problem would arise because only sailors with families would have provided data used in the computation of 93 of the 528 total correlations used in the analyses (i.e., 3 family items with 30 nonfamily items plus 3 correlations between family items). Excluding the family-specific items focused the analysis on developing a measurement structure which was broadly representative of the U.S. Navy population at large. The family and its impact on stress in sailors will be topics of a separate study after defining a basic general frame of reference for stress in this study.

Distress Measures. The distress measures included the CES-D scale [14] items and the NHRC quality of life measures [15]. The 8 CES-D items asked the person to indicate how often during the past 7 days they "felt you just couldn't get going," "felt sad," "had trouble getting

to sleep or staying asleep," "felt everything was an effort," "felt lonely," "felt you couldn't shake the blues," and "had trouble keeping your mind on what you were doing." Respondents answered using response options ranging from "No days (0)" to "Seven days (7)" in daily increments. The items chosen reflect 3 of 4 reliable dimensions in the CES-D, i.e., feelings, disruptions of behavior, and social isolation. A small, but reliable, dimension dealing with the absence of positive affect is not included [cf., 16]. However, this omission is not problematic as the present use of the CES-D items was to define a general construct of depressed mood or dysphoria rather than to examine specific subdimensions of this general construct.

The quality of life items asked the respondents to indicate "How do you feel about your:" for each of the following: (a) Job, (b) Personal life, (c) Health and physical condition. (d) Life as a whole, (e) Family, (f) (If married) Spouse, (g) (If you have children) Children. Response options ranged from "Terrible (1)" to "Delighted (7)". The items pertaining to spouse and children were not used in the present analyses for the reasons discussed above in considering family stresses.

Analysis Procedures

Exploratory Factor Analyses. Exploratory factor analyses and cluster analyses were conducted with the FACTOR and CLUSTER programs of SPSS [17]. Exploratory factor analyses were conducted with principle factors extraction (PAF) followed by orthogonal varimax rotation. Analyses were performed separately for men and women and repeated to obtain 2, 3, 4, 5, and 6 factor solutions for each gender.

Several criteria were used to determine the number of factors to retain for confirmatory modeling. One set of criteria was based on within-sample evaluations. The criteria for the within-sample evaluations focused on how many factors were needed to extract the systematic covariation between items. The number of eigenvalues > 1.00 (i.e., Kaiser's criterion) set an upper limit for the number of factors. Recent Monte Carlo studies of the distributions of eigenvalues obtained when analyzing random data provided more stringent criteria. The average expected eigenvalue for the nth factor in random data was determined from Lautenschlager's (18) simulations. The 95th percentile of the distribution of eigenvalues for random data was estimated from Cota, Longman, Holden, Fekken, and Skivoulas [19].

A second set of criteria emphasized replication of factors across samples. Cross-validation focuses on how many factors can be reliably identified when multiple samples are considered. This information is a fundamental consideration if replicable phenomena are a basic requirement for a scientific model. The replicability criterion was applied by dividing the male and female samples randomly in half. Factor analyses then were carried out in each subsample. Coefficients of congruence (20) were computed to determine factor similarity across the two subsamples. The computations were performed by applying the BMDP 4M factor analysis program [21] to the combined set of factor loadings from the two subsamples. The BMDP program computes

correlations about the origin. These computations yield coefficients of congruence [20] when applied to factor loadings.

The factor-matching analyses were restricted to within-gender comparisons. The restriction avoided using the goodness of matching of factors across genders as a criterion for how many stress factors were present. The use of cross-gender matching as a criterion would have biased results toward retention of the model for which men and women were most alike. This bias would severely hamper attempts to identify gender differences in the measurement structures if any exist.

Hierarchical cluster analysis provided a further test of replicability. In this case, the analyses were used to evaluate how well results generalized across analysis procedures. Conceivably, the number of underlying constructs identified by factor analysis could depend on the algorithms and constraints built into this analysis procedure. Cluster analysis employs different algorithms for grouping items and, therefore, might yield somewhat different results. If so, the differences might be used to define alternative models or refine the models suggested by factor analysis.

The SPSS CLUSTER subroutine [17] was employed with stress indicators as the variables to cluster. Correlations (cosines) were the distance measure. Solutions with 2 to 6 clusters were determined separately for men and women, but the full sample was used for men and for women. This decision provided the most stable set of correlations available for clustering and emphasized the focus on robustness across analysis methods rather than replication within genders.

The clusters for women and men were matched across samples to maximize the number of items assigned to the "same" cluster in each sample. Cohen's [22] kappa was provided a summary statistic to describe how closely the female and male solutions matched.

Confirmatory Analyses. Confirmatory factor analysis procedures addressed the alpha-beta-gamma model from a psychometric latent trait perspective. Latent traits are hypothetical causal factors inferred to account for patterns of covariation in observed behaviors. Comparisons between the patterns of covariation predicted by different latent trait explanatory models and the observed covariations provide tests of hypotheses about the latent traits. Models can differ in the number of traits inferred and the correlational or causal connections between the latent trait. Given appropriate item selection, the resulting measurements will have satisfactory precision [22]. With sufficiently developed models, hypotheses can be tested which assume specific patterns of causation among several latent traits. While these hypothesis tests cannot ensure that any given model meets all the conditions required for inferring causality, the model tests can be usefully applied to rule out some alternatives as incompatible with the observed pattern of covariation [23].

Latent trait models can be used to assess gender differences in the Golembiewski et al. [1] framework. The basic procedure involves multiple group comparisons designed to test two broad

hypotheses. The first hypothesis is that the same measurement model applies to women and men for each latent trait (i.e., no beta differences). The second hypothesis is that the relationships between latent traits are the same for men and women (i.e., no gamma differences)..

Joreskog and Sorbom's [24] LISREL VII was the primary analysis tool. Alternative structural models were specified by fixing the number of latent traits and which indicator variables loaded on each latent trait. All models had simple structure (i.e., each item loaded on only one latent trait). Latent trait scaling was fixed by setting the variance at 1.000 for each latent trait. This method of fixing the scale for latent traits made it possible to estimate factor loadings for each item rather than having to fix the loading for at least one item on each dimension.

Stress Models. The confirmatory stress models began with a model which assumed that all stress indicators represented a single general dimension. Additional models were developed which consisted of 2 or 3 dimensions. These models were based on the results of the exploratory factor analyses and cluster analysis as described in the presentation of results.

Distress Models. Three models were considered. The first model treated quality of life and depression items as indicators of a single distress dimension. The second model treated quality of life and depression as separate orthogonal dimensions of distress. The third model treated quality of life and depression as correlated dimensions of distress. Depression was a single dimension in these models even though the CES-D scale [14] has at least four reliable dimensions [16]. The four dimensions are correlated as would be expected of specific components of a general psychological syndrome. Furthermore, the item sampling for the present survey did not provide a basis for clearly defining the individual dimensions. Thus, this set of items was best treated as an overall indicator of general depression.

Stress-Distress Models. The previously developed stress and distress measurement models were fixed components of the stress-distress models. Factor loadings for individual stress items and factor correlations were fixed at the values estimated previously in the development of the measurement models. The stress-distress analyses, therefore, focused solely on relationships between stress and distress. Anderson and Gerbing [30] provide a rationale for this two-stage approach modeling the relationships between different constructs. Meehl [31] provides a philosophical rationale for separating the specification of measurement models from tests of relationships between constructs.

Stress-distress relationships were investigated by estimating correlations between latent traits. The analyses utilized a saturated model, i.e., one which included all possible correlations. Gender differences were evaluated by constraining the correlations for women and men to be equal, then performing a second analysis which removed that constraint for all of the correlations.

Matrices Analyzed. The interitem correlation matrices computed with a pairwise missing data option were analyzed. This choice of matrices to be analyzed raised two issues pertinent to the analysis of correlations. The decision to analyze correlation matrices rather than covariance matrices was out of the ordinary, but defensible. Joreskog and Sorbom [24, pp. 46-49] note that analysis of correlation matrices poses several risks. First, equality constraints on factor loadings can lead to incorrect decisions about which loadings to retain. The present analyses imposed constraints across the male and female samples, but not on parameters within samples. The cross-gender constraints were eliminated in tests for gender invariance of the models, so any effect of those constraints on model selection should be detected in the analysis.

Analyzing correlation matrices also runs a risk that standard errors and chi-square tests may be inaccurate. One condition that must be satisfied to eliminate this risk is that the diagonals for the estimated correlation matrix must equal to 1.00. This condition generally is met if the error terms for individual indicators and the correlations between latent traits are estimated freely. These conditions applied for the development of stress and distress measurement models in the present analyses. However, when the two models were combined to estimate stress-distress relationships, constraints were imposed on some latent trait correlations. The final stress-distress model, therefore, was reanalyzed with those constraints removed. Removing the constraints had a trivial effect on the model fit to the data. Thus, any deviation from 1.00 in the diagonals of the estimated correlation matrices had little impact on the estimated fit of the model to the data.

Scale invariance is a second condition which must be satisfied to ensure that model fit to the data is properly estimated. According to Joreskog and Sorbom [24], maximum likelihood estimators of fit provide scale invariant chi-square values. If so, this condition also should have been satisfied in the analyses.

The preceding points indicated that the use of correlation matrices met minimal standards for providing accurate results. Joreskog and Sorbom [24] caution that the conditions specified are only minimum requirements, but these considerations do somewhat reduce the risk of incorrect conclusions. In addition, the use of correlation matrices meant that the exploratory and confirmatory analyses were based on the same statistics.

The decision to employ pairwise missing data in the computation of correlations represented an extension of the logic that led to dropping the family stress items from analyses. In that case, the items were relevant only to a minority of the sample. Those items were dropped because their inclusion would have made that minority unduly influential in the overall analysis. The use of missing data in correlations reflects a similar case, most of the items analyzed were completed by all or nearly all respondents. Sample sizes for individual items ranged from 893 to 1,019 for men and from 790 to 1,047 for women. These ranges were misleading, because most items were completed by more than 1,000 respondents in each group (men, 20 items; women, 25 items). Very few items were completed by fewer than 900 respondents (men = 2 items; women, 4 items). However, only 602 males and 534 females had complete data. Many

people who were missing data lacked only a few items. For example, 286 men and 395 women were missing 3 or fewer items. These figures point to the fact that listwise deletion of cases with missing data would have meant that only a select, potentially nonrepresentative, subset of people would have contributed to the estimation of correlations. The use of pairwise deletion avoided this problem by basing the sample estimates of population correlations on the largest amount of data possible.

LISREL requires that the sample size for a matrix be specified. The average number of data points per item was 1,003 for women and 992 for men. These averages were rounded to 1,000 for women and 990 for men. This decision choice of estimated effective sample sizes affects the chi-square values computed by the program, but should have a limited effect on inferences drawn from the study. The limited effect of sample size derives from the fact that different models are compared in terms of goodness of fit. Sample size was a constant multiplier in the chi-square computations of for the models [25]. The goodness of fit indices (see *Model Comparison Criteria* below) are based on the relative size of chi-squares for alternative models. The relative size is determined by the magnitude of the misfit between models and data, not by sample size. Thus, the model comparisons will not be affected generally by the choice of sample sizes specified for the models.

Gender Differences. All structural modeling proceeded in two steps. The first step developed and tested models which assumed that the same parameter values applied to women and men. These models are referred to as gender-invariant models. The models then were evaluated assuming that different parameter values were appropriate for men and women. The second set of models are referred to as gender-specific models. The gender-specific models should fit the data better than the gender-invariant models, because the latter employ twice as many statistical parameters to reproduce the data. The criterion for inferring gender differences, therefore, was whether the improvement in fit from gender-invariant models to gender-specific models was sufficient to justify the increased complexity of the latter model.

Model Comparison Criteria. Models were compared using the Tucker and Lewis' [26] fit index (hereafter, TLI) with Mulaik et al.'s [31] parsimony adjustment (hereafter ATLI). The TLI is a goodness-of-fit index (GFI) indicating the proportion of the observed nonchance covariation between indicator variables was accounted for by a model. This GFI was computed from chi-square statistics produced by the modeling program using the following formula:

$$TLI = (R_n - R_m)/(R_n - 1)$$

where "R_n" is the ratio of the chi-square to degrees of freedom for the null model and "R_m" is that ratio for the alternate model under consideration. The denominator is $(R_n - 1)$ to take into account the fact that the chi-square to degrees of freedom ratio has an expected value of 1.00 large samples when all of the true population correlations are r = .00. In this sense, the TLI can be

thought of as the proportional reduction in nonchance covariation provided by the model being tested.

ATLI is derived from TLI by taking into account the number of degrees of freedom utilized to estimate the model. The adjustment adjusts for the fact that models with more free parameters are expected to reproduce data better than those with fewer free parameters if the additional parameters are well chosen [cf., 31]. The computation is:

$$ATLI = TLI * (df_m/df_n)$$

where "df_m" is the degrees of freedom in the model being evaluated and "df_n is the degrees of freedom in the null model.

The computation of the TLI depends on the choice of a null model. The common null model assumes that there is no covariation between indicators. When this null model is employed, TLI equals zero only when a model explains only a chance amount of covariation between indicators. TLI equals 1.00 when the residual chi-square is equal to the degrees of freedom in the data set (i.e., when the model explains all nonchance covariation). ATLI will always be less than TLI any time the model involves the estimation of at least one parameter value. In this case, $df_m < df_n$ so the multiplier in the ATLI equation is less than 1.00.

GFI values were used for comparative purposes with limited attention to the raw magnitude of the GFI. The focus was identification of the most reasonable model among those under consideration. When the size of the GFI is considered, values in excess of .900 were originally recommended [27]. More recent guidelines emphasize the importance of taking the current state of the art into account when evaluating the quality of fit [25]. Attempts to achieve a .900 fit in areas where models are not well-defined and validated can lead to post hoc modifications which add parameters based on chance covariations to achieve the .900 goal [28]. The present analyses, therefore, used .900 as an upper limit to define a stopping point in examining the fit of models to data. Incomplete specification does not necessarily distort the measurement of latent traits as long as the items used as indicators are properly chosen [3]. Overall, however, the model selection approach focused on comparison of simple, logically plausible alternatives rather than an exhaustive search for complex alternatives which merely improve fit without changing the substantive meaning of the model.

Statistical tests of fit were a final consideration in some model evaluations, especially those pertaining to gender differences.. These tests were used to emphasize the trivial size of gender differences in the structure of stress and distress. Given the large sample size, even minor differences between women and men would lead to statistically significant improvements in fit when gender-specific models were considered. In fact, those differences frequently were statistically nonsignificant despite the large sample size. Thus, nonsignificant effects are noted to emphasize the good fit of the gender-invariant models to the data.

RESULTS

Stress Models

Exploratory Analyses. Several observations pointed to the existence of a general stress factor. All interitem correlations between stress items were positive. For men, the correlations ranged from r = .12 to r = .69 with an average of r = .30. For women, the correlations ranged from r = .05 to r = .71 with an average of r = .28. These positive manifolds suggested the possibility of a general stress factor, a possibility that was supported a large eigenvalue for the first factor for both genders (males = 9.94, 33.1% of the variance; females = 9.36, 31.2% of the variance).

Despite the large first factor, other evidence suggested that between 2 and 6 factors were needed to reproduce the observed correlations between the stress items. The upper limit of this range was fixed by the observation that six eigenvalues exceeded 1.00 for both men and women. These factors accounted for 59.1% of the variance for males and 57.9% of the variance for females.

A lower limit of 4 factors was suggested by Cota et al.'s [18] 95th percentile values for simulated random data with a sample size of 500. By this conservative criterion, either 3 or 4 factors would have been appropriate for males and 4 factors would have been appropriate for females. The choice for males was ambiguous because the observed eigenvalue of 1.33 was close to, but slightly less than, the critical value of 1.36 derived from the table. This slight discrepancy posed interpretive problems because the size of the critical eigenvalues in Cota et al.'s [18] tables decreases with increasing sample size, The critical value for a sample of 1,000 would almost certainly be less than but this inference could not be confirmed directly from the table because no sample sizes larger than 500 were included in the Monte Carlo analyses.

The exploratory analyses strongly contradicted the supposition that more than four nonchance factors were present. The fifth eigenvalue in the male sample was 1.25, while that in the female sample was 1.20. The average size of the fifth eigenvalue expected given 30 variables and a sample size of 1,000 is 1.20 [19], so each sample produced values that only slightly exceeded the average for this combination. The sixth eigenvalue clearly was less than the average value expected given true independence of the measures (1.18) for both genders (males = 1.13; females = 1.04) .

Tests for factor replicability suggested that 3 or 4 factors would be appropriate. The coefficients of congruence [20] computed for women and men indicated that:

(a) Women: The 3-, 4-, 5-, and 6-factor solutions produced three factors with coefficients of .880 or more. The fourth through sixth factors all had coefficients of .624 or less.

(b) Men: All solutions produced 2 factors with coefficients of .798 or higher. A third factor was weakly identified in the 3-, 4-, and 5-factor solutions with coefficients of congruence between .574 and .799.

The cluster analyses suggested that four distinct groups of stresses were evident. Cohen's (29) kappa was largest for the 4-cluster solution (kappa = .897), but kappa was only slightly smaller for the 3-cluster solution (kappa = .888). The 2-, 5-, and 6-cluster solutions produced kappas between .851 and .858. Thus, the 3- and 4-cluster solutions defined a peak in the kappa profile across the range of clusters considered.

A Three-Dimensional Upper Limit. The combined results of the within-sample and replication analyses suggested that either a 3- or 4-dimensional model was appropriate. Examination of the details of the different solutions gave reason to believe that the 3-factor representation was more reasonable. One fact contributing to this conclusion was the observation that adding a fourth factor to the models would mean that one dimension would be represented by only two items. From a modeling perspective, a factor can be defined by just two indicators, but it is more likely to be treated as an instance of correlated disturbances or error terms. Modifying models to allow for such correlations runs a substantial risk of distorting a correct model by capitalizing on chance [28]. A second fact suggested that chance might indeed be an influence on the findings, because the content of the fourth dimension depended on the method of analysis. Cluster analysis suggested promotion and downsizing as a pair, while the factor analyses suggested personal health and promotion. This difference indicated that the content of this dimension depended on analytic methods. These considerations were reason to reject the addition of a fourth factor to the model. Three dimensions, therefore, were adopted as the upper limit for model complexity.

Derivative Structural Models. The primary item content of the dimensions for different structural models was specified, and a unidimensional model permitted all stress items to load on a single factor. A 2-dimensional model used shipboard items to define one dimension and the Navy life items to define a second dimension. A 3-dimensional model retained the Navy life dimension, but used the living conditions and job stress items to define distinct factors. Further details of the models are specified in the following description of the modeling procedures.

Structural Modeling Decisions. Structural equation modeling of stress began with two decisions. One decision fixed the upper limit of model complexity at three dimensions. The reasons for this decision were described in summarizing the results of the exploratory factor analyses.

The second decision was that stress dimensions could be correlated. This decision provided the opportunity to determine whether any correlations approached r = 1.00. If so, the evidence would support the position that two hypothetically different dimensions actually measured the same construct and should be represented by a single dimension in the model.. A

second reason was that constraining the latent trait correlations to r = .00 would be at odds with the observation that all stresses tended to be moderately intercorrelated. The predicted correlation between two stress items which loaded on separate dimensions will be r = .00 if the two dimensions are uncorrelated. Thus, for example, fixing the correlation between the shipboard and Navy life dimensions in the two-dimensional model at r = .00 would mean that all of the estimated correlations between specific items defining the shipboard and Navy life dimensions would equal zero. This estimate was logically incompatible with the evidence that all interitem correlations were positive. Conceptual analysis provided the third reason for permitting correlated latent traits. Causal connections between stresses can be expected. For example, interpersonal problems might affect job performance, thereby influencing job stress. Knowing the pattern of correlations between stress dimensions could be an important starting point for developing models of stress dynamics in ships' crews. Based on these considerations, four alternative stress models were considered:

(a) Unidimensional: All stress items were indicators of a single general stress dimension.

(b) 2-dimensional (2-D): Stress items were divided into shipboard items and all other items. Labeling the first dimension "shipboard conditions" was straightforward. The second dimension was labeled "Navy life" stress because it combined items specific to the Navy as a general setting for living and working (e.g., promotion, downsizing) with other life events that apply to people outside the Navy as well as to sailors (e.g., finances, personal health, family well-being).

(c) 3-dimensional (3-D): The shipboard conditions of stress were subdivided into living conditions and job stress. The "living conditions" label reflects the fact that items which loaded on this dimension primarily dealt with non-job aspects of living aboard ship (e.g., crowding). The third dimension was labeled "job stress" because it was defined primarily by interactions with people on the job (i.e., supervisors, peers, and subordinates) and the nature of work (e.g., how things are typically done). The "Navy Life"dimension was the same as in the 2-D model. As in the case of the 2-D model, the dimensions were assumed to be correlated and for the same reasons.

(d) General + Specific (G+S): All stress variables were assumed to be influenced by a general causal source of stress. The general dimension was labeled "Navy Experience" to differentiate it from the "Navy Life" dimension in the 2-D and 3-D models. The substitution of "Experience" for "Life" was intended to capture the broader inclusiveness of the general dimension as it now encompassed all aspects of Navy experiences reflected in the stress indicators. The living conditions and job dimensions from the 3-D model were retained as specific factors that were orthogonal to the general factor. The two specific dimensions were added on the assumption that the indicator variables are influenced by specific events on the job and the specific living conditions that people face in their work and living environments aboard ship. If these conditions and events are

causal influences on reported stress, their influence should be represented as distinct factors. Sensitivity to specific environmental factors is plausible even in the presence of an independent causal factor that influences a wide spectrum of stresses (e.g., whatever causal factor is the basis for the Navy Experience factor). This model was consistent with the size of the eigenvalues and the unrotated factor solutions in the exploratory factor analyses.

The G+S model deviated from the general practice of assuming that stress factors were correlated. The general factor was assumed to be orthogonal to (i.e., uncorrelated with) the specific dimensions. This assumption was included to ensure that the model would be identifiable. The living conditions and job dimensions were permitted to correlate for the same reasons that correlations were permitted in the prior models.

Table 1. Comparison of Alternative Stress Measurement Models, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

MODEL	CHI-SQUARE	df	TLI	ADJUSTED TLI
Null	26482.49			
Unidimensional				
Gender Invariant	10075.66	840	.627	.605
Gender Specific	10033.45	810	.613	.571
Navy Life/Shipboard				
Gender Invariant	6732.18	836	.760	.731
Gender Specific	6699.18	802	.750	.692
Navy Life/Living Conditions/Job				
Gender Invariant	5449.74	832	.812	.776
Gender Specific	5410.72	794	.803	.732
Navy Experience/Living Conditions/Job				
Gender Invariant	5379.92	821	.814	.768
Gender Specific	5328.84	772	.800	.709

Note: See test for description of the models. "df" indicates degrees of freedom. The adjusted TLI applies the Mulaik et al.[31] parsimony adjustment to the raw TLI. Both of these goodness-of-fit indicators are defined in the analysis procedures section of Methods.

Results. The stress measurement structural analyses produced two clear findings. First, measurement was invariant across genders. The improvement in fit obtained by moving from an

invariant model to a gender-specific model was clearly nonsignificant for the 2-D, 3-D, and G+S models ($.424 < p < .783$). The improvement in fit approached significance for the univariate model (chi-square = 42.21, 30 df, $p < .069$). Even this marginal result gave no reason to consider rejecting the gender-invariant model in light of the large sample size for the analysis.

Second, models with three dimensions reproduced the observed correlations much better than models with fewer dimensions. The GFIs for the 3-D and G+S were substantially larger than those for the other models.

The results were not clear regarding which 3-dimensional model was better. The GFIs for the 3-D and G+S models differed only at the third decimal place. The G+S model did yield a statistically significant chi-square reduction (chi-square difference = 69.78, 11 df, $p < .001$). This statistical test for model differences was not sufficient reason to reject the 3-D model, because the chi-square reduction was influenced by the large sample size [25]. The GFI comparisons were reason to retain both models for further study.

Distress Measurement Models

The distress measurement models were specified a priori based on a rational analysis of plausible structures for the indicator variables (see *Methods*, p. [add]). Once again, gender differences were absent (Table 2). Chi-square differences between gender-invariant and gender-specific models ranged from 21.10 to 24.55 with 12 or 13 degrees of freedom. The statistical significance of the chi-square differences ranged from $p < .017$ to $p < .071$. While the chi-square differences were statistically significant (or at least marginally so), there were several reasons for regarding the gender differences as trivial. First, the TLI values for the gender-specific models were consistently less than the TLI values for the corresponding gender-invariant models. Second, parsimony adjustments accentuated this difference. Third, the significance tests have to be discounted somewhat because of the large sample sizes. Fourth, the model which provided the best fit to the data was the one which produced only a marginally significant chi-square reduction (i.e., $p < .071$ for two correlated distress dimensions). Thus, even with the large sample size, the best fitting model did not produce statistically significant improvements in fit.

Table 2. Comparison of Alternative Distress Measurement Models, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

MODEL	CHI-SQUARE	df	TLI	ADJUSTED TLI
Null	11211.94			
Unidimensional				
Gender Invariant	2182.50	120	.795	.723

MODEL	CHI-SQUARE	df	TLI	ADJUSTED TLI
Gender Specific	2157.95	108	.774	.633
QOL/Mood - Orthogonal				
Gender Invariant	1789.01	120	.834	.758
Gender Specific	1767.89	108	.817	.668
QOL/Mood - Correlated				
Gender Invariant	999.71	119	.912	.822
Gender Specific	978.61	106	.902	.724

Note: See Analysis section of Methods for description of the models. "df" indicates degrees of freedom. ATLI applies the Mulaik et al. [31] parsimony adjustment to the raw TLI.

The QOL/Mood-Correlated (QMC) model was the clear choice for best model. This model provided the best absolute fit to the data and substantially larger GFI values than the other two models. The TLI value for this model was large enough to forego any search for more complex models [27].

Stress and Distress

Investigation of the stress-distress relationships provided tests for the presence of gamma differences between women and men. The primary concern in these tests was whether the pattern of correlations between the stress dimensions and distress dimensions differed for men and women. Two sets of analyses were conducted. The first set used the 3-D stress measurement model. The second set used the G+S model. Distress was represented by the QMC model in both sets of analyses.

Chi-squares for the stress-distress component of the models were computed by subtraction. The chi-squares for the measurement models (see Tables 1 and 2) were subtracted from the total chi-square computed for each stress-distress model. The total chi-square for the model is the sum of these three components. The contributions of the measurement models were fixed elements because the measurement models were fixed. The stress-distress associations only accounted for the stress-distress correlations, so the model's utility should be evaluated with a chi-square based on those correlations as the frame of reference. Subtraction provided the appropriate estimate of the models' utilities in reproducing those correlations.

Results. Once again, women and men were comparable (Table 3). As in prior analyses, the GFI values for gender-specific models were less than the corresponding values for the gender-invariant models. Gender-specific models significantly reduced the chi-square for the 3-dimensional model (chi-square change = 18.16, 6 df, $p < .006$) and the G+S model (chi-square

change = 18.19, 6 df, $p < .006$). However, once again, the outcome of these statistical tests for the significance of gender differences was heavily dependent on sample size.

Table 3. Comparison of Stress-Distress Models, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

MODEL	CHI-SQUARE	df	CHI-SQUARE/DF RATIO	TAI	ADJUSTED TAI
Null	4040.18	720			
Three-Dimensional					
Gender Invariant	2851.58	714		.351	.348
Gender Specific	2833.42	708		.349	.343
General + Specific					
Gender Invariant	2864.04	714		.347	.344
Gender Specific	2845.85	708		.345	.339

Note: The QMC distress measurement model was one component of each stress-distress model, so models have been labeled to reflect the stress dimensions used to predict distress.

Sample Size Considerations. The stress-distress findings produced statistically highly significant differences between women and men. This outcome contrasted with the pattern of statistically nonsignificant or marginally significant differences in the evaluation of measurement models. The possible differences between women and men suggested the presence of gamma differences in stress. This possibility is very important in making decisions about how to best construct models of stress, but the reality of the need for distinctive female and male models of stress was questionable. The TLI values favored the retention of a single model for both men and women. The difference was slight, however, so further attention was given to the female-male differences.

The apparent significance of the differences between women and men was attributable more to sample size than to substantive differences in the underlying stress-distress model. The influence of sample size on chi-squares can be assessed by applying Hoelter's [33] critical N reasoning to the chi-square reductions. Hoelter's [33] approach begins with the observation that even trivial misfit between a model and data can be statistically significant if the sample size is large enough. Hoelter [33] therefore proposes that the largest sample size that would yield a statistically nonsignificant chi-square given the observed misfit between the model and the data be identified. This sample size is the "critical N" for the model. If the critical N is very large, the underlying discrepancy is small in the same way that a small correlation (e.g., $r = .05$) will be statistically significant only in a very large sample. Hoelter [33] suggests 200 as a reasonable upper bound for critical N.

The determination of critical N in the present case begins by noting that neither of the chi-square reductions produced by changing from a gender-invariant stress-distress model to a gender-specific version of the model would have been statistically significant ($p < .05$) if the chi-square had been 12.59. This maximum allowable value for the chi-square is set by noting that with 6 degrees of freedom, a chi-square of 12.60 is statistically significant at the $p < .05$ level.

The maximum allowable chi-square was 69.2% of the observed chi-square for the G+S model. The model chi-square values are

$$\text{Chi-square} = FF_m * (N - 1)$$

where "FF_m" is the value of the fit function and "N" is the sample size (25). It follows from this formula that decreasing the sample size by a certain proportion produces an approximately equal proportional reduction in the chi-square. In the present instance, decreasing the sample size to 69.1% of the present sample sizes would yield a chi-square which was less than the critical value of 12.59. Thus sample sizes of approximately 684 for men and 690 for women would have resulted in a statistically nonsignificant chi-square reduction. These figures are more than 3.4 times Hoelter's [33] critical N of 200 which he recommends as a guideline for identifying substantial misfit between the data and the model.

The conclusion that the reductions in misfit were statistically significant, but trivial in terms of overall improvement in fit follows from these observations. This argument also applies to other "statistically significant" gender differences reported in this paper and underscores the fact that gender differences truly were minor when they were statistically nonsignificant.

Selection of a Final Stress-Distress Model

The two stress measurement models were equally effective in summarizing stress-distress relationships (Table 3). The 3-D model provided a slightly better overall fit to the data (chi-square difference = 12.46), but the difference was trivial relative to the total residual misfit (i.e., < 0.5% of the residual). While both models were equally useful in summarizing the stress-distress relationships, neither model was particularly effective in this regard. The TLI and ATLI values were less than .400 for all models, but this criticism applied to both models.

Table 4. Correlations Between Stress and Distress Latent Traits, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

STRESS MODEL		QUALITY OF LIFE	DEPRESSION
3-D:	Navy Life	-.626	.680
	Living conditions	-.264	.394
	Interpersonal	-.345	.434

G+S:	Navy Experiences	-.624	.677
	Shipboard Life	.091	.030
	Interpersonal	-.020	.091

Further examination of the analysis results provided a basis for choosing G+S model over the 3-D model. One relevant consideration was that the 3-D model would require a more complex explanatory theory to support the model. All three stress dimensions in this model were positively correlated (r = .525 to r = .549). These correlations could be explained by adding a general second-order factor. The correlations also could be explained by specifying causal relationships between the stress dimensions. By comparison, the G+S model contained only a single intercorrelation which was smaller in magnitude (r = .354).

The stress-distress findings provided a second piece of evidence relevant to the choice of models. The 3-D model appeared to produce a more complex representation of stress-distress relationships. All six correlations involving the 3-D model were r = .26 or greater (Table 4). In contrast, only the Navy Experience correlations exceeded r = .10 (absolute) in the G+S model. Applying Cohen's [34] definitions of effect sizes for correlations, the four associations in the G+S model which were less than r = .10 (absolute) are too small to be considered important for theory. The G+S model, therefore, provided a more parsimonious representation of the stress-distress associations.

A third reason for adopting the G+S model was evidence that the "active ingredient" was the same in both models. Navy Life was the primary distress predictor in the 3-D model. Navy Experiences filled that role in the G+S model. The evidence that these two dimensions assessed the same construct included:

a. The correlations between these two stress dimensions and distress indicators were virtually identical (Table 4), differing by less than .003 for both quality of life (r = -.626 versus r = -.624) and depression (r = .680 versus r = .677).

Table 5. Factor Loadings for Selected Items, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	ITEM FACTOR LOADING FOR:	
	NAVY LIFE	NAVY EXPERIENCES
Finances	.393	.392
Personal life	.459	.462
Family	.386	.388

	ITEM FACTOR LOADING FOR:	
Promotions	.497	.500
Down sizing	.377	.382
Special friend	.572	.572
Breaking up	.560	.559
Community problems	.606	.605
Adapting to life after return	.569	.571
Concern about the future	.758	.756
Problems with alcohol	.432	.433
Feeling isolated	.720	.720
Being out of touch	.708	.706
Stress in one's whole life	.775	.774

Note: The Navy Life factor loadings were estimated in the 3-D stress model. The Navy Experiences factor loadings were estimated in the G+S model.

b. Structural model dimensions are identified and defined by the pattern of factor loadings relating the latent traits to indicator variables. The pattern of relationships for Navy Life and Navy Experiences were virtually identical for those items that loaded solely on those factors (Table 5). The factor loadings for those 14 items (nearly half of the total of 30 items) differed by .005 or less.

c. The Navy Life dimension is the critical concern in the choice of models because it was the basic predictive element of both models. This point is clear for the G+S model, but the presence of substantial relationships to the habitability and job dimensions in the 3-D model suggest the possibility of better prediction with this model. The fact that the GFI values were equivalent for the two models provided general evidence that this was not the case, but it is informative to consider the actual prediction problem further to show why this equivalence arose. Living conditions and job stress were substantially related to distress in the 3-D model; correlations between distress and these two stress dimensions in the 3-D model therefore were at least partially redundant with the correlations between distress and the Navy Life dimension. Semipartial correlations (hereafter sr; cf., 34, pp. 88-90) were computed to estimate the nonredundant correlation between distress and the 3-D living conditions and job dimensions. The estimated latent trait correlations was used in these computations. All four semipartial correlations were less than .10 in absolute magnitude (Living conditions-Quality of Life, sr = .095; Living conditions-Depression, sr = .026; Job-Quality of Life, sr = -.019; Job-Depression, sr = .091). These figures

indicated that Living conditions and Job stress each accounted for less than 1% of the variance in the distress latent traits after controlling for Navy Life stress. These effect sizes might be statistically significant given the large samples involved, but feel below Cohen's [35] lower bound for a small effect size, the minimum association which would be construed as having practical or theoretical significance. Note, also, that the sr values were very close to the latent trait correlations obtained in the G+S model.

The overall evidence indicated that the G+S model was comparable to the 3-D model with respect to reproducing the pattern of correlations between stress items and reproducing the stress-distress correlations. The G+S model was more parsimonious, however, as fewer causal relationships between latent traits would have to be invoked to achieve this outcome. The models were plausible competing alternatives, but the G+S model was more parsimonious.

Primary Areas of Misfit Between the Model and Data. Both stress-distress models had limited explanatory power as indicated by the modest GFI values. This limitation was surprising given the size of the correlations between the Navy Experience dimension and both distress dimensions (absolute $r > .623$). The small GFI values may indicate a pattern of diffuse misfit between the model and the data for both genders. Diffuse misfit would be consistent with a "micro stress" model in which individual stressors, i.e., conditions reflected in specific items, affected specific distress indicators. If specificity is critical to understanding the effects of stress, a model which represents stress solely in terms of general dimensions would be misleading. Thus, the residuals for the G+S model were examined for men and women to determine whether they were replicable across genders and, if so, whether a micro stress model should be considered as an alternative to the G+S model.

The exploration of misfit began with a visual inspection of the stress-distress residuals matrix. This inspection indicated that residuals almost always were negative for QOL indicators and almost always positive for depression indicators. Given that high scores on QOL imply low distress, both trends are consistent with the perspective that the model underestimated the degree to which stress caused distress. The sign of the QOL residuals therefore was reversed for further computations so that residuals with the same sign could be interpreted comparably for both types of distress indicator.

Table 6. G+S Stress Model: Confirmatory Factor Loadings for Individual Items, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	NAVY EXPERIENCE	LIVING CONDITIONS	JOB	QOL	CES-D
Stress Indicators					
Whole life	.476	.000	.292	.000	.000
Financial	.392	.000	.000	.000	.000

	Navy Experience	Living Conditions	Job	QOL	CES-D
Stress Indicators					
Personal health	.462	.000	.000	.000	.000
Family personal or health	.388	.000	.000	.000	.000
Being aboard ship	.410	.464	.000	.000	.000
Crowding aboard ship	.383	.729	.000	.000	.000
Safety aboard ship	.398	.521	.000	.000	.000
Hygiene aboard ship	.339	.473	.000	.000	.000
Privacy aboard ship	.410	.695	.000	.000	.000
Lack of exercise aboard ship	.387	.427	.000	.000	.000
Lack of recreation aboard ship	.395	.512	.000	.000	.000
Nutrition aboard ship	.376	.494	.000	.000	.000
Supervisor	.370	.000	.583	.000	.000
Peers	.418	.000	.647	.000	.000
People supervised	.327	.000	.552	.000	.000
Way things typically done	.411	.315	.349	.000	.000
People in living space	.408	.556	.000	.000	.000
Ability to perform duties	.562	.000	.241	.000	.000
Chances for promotion	.500	.000	.000	.000	.000
Downsizing	.382	.000	.000	.000	.000
Relationship to spouse/boyfriend/girlfriend	.572	.000	.000	.000	.000
Breaking up with spouse, etc.	.559	.000	.000	.000	.000
Communication with family/friends	.605	.000	.000	.000	.000
Adapting after deployment	.571	.000	.000	.000	.000
Feeling confined	.676	.231	.000	.000	.000
Personal future/meaning of life	.756	.000	.000	.000	.000
Use of alcohol	.433	.000	.000	.000	.000
Feeling isolated	.720	.000	.000	.000	.000

	NAVY EXPERIENCE	LIVING CONDITIONS	JOB	QOL	CES-D
Stress Indicators					
Feeling out of touch	.706	.000	.000	.000	.000
Life as a whole	.774	.000	.000	.000	.000
Distress Indicators					
Job	.000	.000	.000	.398	.000
Personal Life	.000	.000	.000	.753	.000
Health	.000	.000	.000	.517	.000
Life as Whole	.000	.000	.000	.855	.000
Familiity	.000	.000	.000	.624	.000
Couldn't get going	.000	.000	.000	.000	.652
Sad	.000	.000	.000	.000	.836
Trouble sleeping	.000	.000	.000	.000	.557
Everything an effort	.000	.000	.000	.000	.672
Lonely	.000	.000	.000	.000	.715
Couldn't shake blues	.000	.000	.000	.000	.872
Trouble concentrating	.000	.000	.000	.000	.752

Note: The living conditions and job stress latent traits were correlated r = .354. QOL and CES-D latent traits were correlated r = -.651. See Table 4 for correlations between stress and distress latent traits.

Large residuals tended to be associated with specific types of stress and distress. The QOL job item was the major source of misfit for distress indicators with an average residual of 4.18. The next largest average distress residual was -1.17 for the CES-D blues item.

The importance of different stresses also varied. The residuals for financial matters clearly were the largest (average residual = 4.77). Personal health (average residual = 2.63), personal or health matters of a family member (average residual = -2.80), and personal future/meaning of life (-2.71).

The G+S Model. The factor loadings for the G+S stress measurement model are given in Table 6. These factor loadings provide a complete description of the model when coupled with the correlation between living conditions and job stress (r = .354)

DISCUSSION

The findings reported here simplify the study of shipboard stress in two important ways. First, female and male sailors can be treated as a single population. Male and female sailors differed trivially with respect to the structure of perceived stress, reported distress, or the relationship between the two. Thus, neither beta nor gamma stress differences in stress were evident in this study. The absence of differences is consistent with the position that stress reports measure the same constructs in female and male sailors. This equivalence verifies a fundamental measurement assumption that is required for meaningful tests of female-male differences in the mean and/or variability of stress. The analyses set the stage for comparing the stress distributions of women and men to test hypotheses about differences in mean and variability.

Further simplification derives from the observation that only a single stress dimension may be needed to capture the essential components of shipboard stress. Only one general dimension of stress was needed to extract the full predictive power of the stress measurement models. At least two additional factors were empirically reliable, but these factors were not related to distress. The general stress dimension, therefore, represented the "active ingredient" in the overall stress reports as far as distress is concerned. The additional stress dimensions might take on significance if a wider range of criteria were considered (e.g., reenlistment decisions, performance ratings). These possibilities merit consideration as topics for future research.

The breadth of the general stress dimension raises questions about the nature of this construct. This dimension encompassed all stress indicators, including those which were not specifically linked to shipboard life (e.g., finances). This breadth suggests that it is not shipboard living as such that is the important determinant of general stress. This dimension has been tentatively labeled "Navy Experiences" stress, but this label is intended to be more of a description than an interpretation. In latent trait formulations, factors are hypothetical constructs which become manifest in the behaviors or feelings implied by the indicator variables. Each latent trait is assumed to be the product of a distinct underlying set of causal influences comprising a construct [3]. The existence of a general dimension for stress, therefore, implies the existence of a single underlying source of covariation among the stress indicators. This study provided no direct evidence regarding the nature of that underlying source of covariation, so any interpretation beyond simple descriptive labeling of the construct is speculative. The speculations must account for certain facts, including that fact that the types of stressors included in the overall list range from work problems to reactions to the physical environment to interpersonal problems at home and financial difficulties. The specific stresses occur in different social settings, involve different types of problems, and so forth. What underlying processes would have effects that could give rise to such a broad latent trait for stress?

Answers to the preceding question require the identification of one or more potential causes that the various events share in common. Broadly speaking, the options can be divided separated into to categories by regarding behavior (including feelings of stress) as being

determined by the person or the environment. One view is that the range of events and situations encompassed by the stresses is so broad that the only thing all the events share in common is the individual experiencing them. Support for this view is provided by the fact that events which share an identifiable source other than the individual (e.g., job stresses) define more specialized factors that can be represented as independent of the general stress. If the individual is the common source of variance in stress reports, person variables are the logical basis for explaining the general dimension. Personality differences could explain the existence of a general stress factor. For example, Vickers [36] has described a stress reactivity profile which can affect many aspects of a persons life and might act to increase perceived stress as well as heightening distress.

A second view of the general dimension is provided by an environmental perspective. While various stressors occurred in different contexts (e.g., family, ship, working group aboard ship), one commonality shared by all the stresses is that all of them occur in the context of Navy life and/or experiences. Perhaps some careers simply are more stressful than others. If so, the sources of differences in stress should be identifiable in terms of attributes such as length of service, occupational specialty, and other indicators of career status. Previous work indicates that various aspects of shipboard life can be significant determinants of environmental perceptions which could give rise to stresses such as those reported by the present sample [37].

The two alternative explanations for stress have different practical implications. If attributes of the person are the basis for perceiving stress, the key to reducing stress may be selection policies. If career opportunities are the basis for the perceived stress, any attempt to reduce stress would have to be directed toward restructuring career paths. Other interpretations for the general dimension may exist which would direct attention to different methods of reducing stress. The point to these observations is that further study is required to identify the antecedents of stress. Direct action to reduce stress will be most effective if the antecedents are clearly identified, so that stress reduction can be targeted at the relevant processes. Further research could usefully explore the proposed explanations for the general stress dimension to provide a better basis for attempting to minimize stress.

The conclusion that a single stress dimension is central to shipboard stress may appear to be at odds with the results of the exploratory factor analyses. Results of those analyses indicated that 3 or 4 dimensions might be present. It should be remembered, therefore, that the final stress measurement model did include 3 stress dimensions. A fourth dimension was dropped because this dimension appeared to be a very specific factor defined by only two items. The preceding focus on a single dimension derives from the evidence that the two additional dimensions in the 3-dimensional models had little additional predictive power after considering the general stress dimension. This negative finding does not mean that living conditions and job dimensions are not important. These elements of stress may be critical to outcomes that were not covered in this study (e.g., sleep problems, performance ratings). Further research extending the range of outcome variables considered is needed to test adequately evaluate the importance of living conditions and job stresses to provide a complete evaluation of stress aboard ship. Additional

research may show that shipboard stresses and job stresses are critical influences on organizationally important outcomes (e.g., performance, retention). If so, the most important result of identifying the general stress dimension may be that this structural model provides a method of controlling for nuisance variance that otherwise distorts reports of shipboard and job stresses. Further study to evaluate these possibilities should be constructive.

The claim that the same general stress dimension was identified in the 3-D and G+S models also may have appeared surprising. How can the same dimension be identified if one set of indicators defines the dimension in one model and a different set defines it in the second model? The answer to this question lies in the relationship between latent traits and their indicators. Latent traits are comprised of a set of processes that are not directly observed, but are manifested in the indicator variables. Factor loadings reflect the strength of the causal effect of the latent trait on the particular indicator. This causal effect is not changed by altering the set of indicator variables. When the model is correct, the factor loadings can be estimated from even a subset of items [3]. In this view, adding items will not change the factor loadings because the additional items do not affect the hypothetical underlying causal relationships. The additional items merely provide more data to estimate the size of those relationships. The fact that the estimated size of the relationships did not change with the addition of more items to the general dimension when moving from the 3-D model to the G+S model, therefore, should increase confidence that the dimension reflect real underlying causal processes (albeit ones which are not specified at this time) and not merely a quirk of the data.

The structural model for distress merits comment even though it was not a major focus of the study. The distress findings clearly demonstrated that quality of life and dysphoria were separate, correlated dimensions. The estimated latent trait correlation was $r = -.65$. This value may appear large relative to the correlations obtained in ordinary correlational analyses, but the proper comparison in the present case is the upper limit of $r = -1.00$. This frame of reference is appropriate because $r = -.65$ is an estimate of the true population correlation, i.e., the correlation that would be obtained if error-free measures were available for both quality of life and dysphoria. The reported value is equivalent to what would be obtained if ordinary correlations between two scales were corrected for attenuation due to measurement error (cf., 22). With this point in mind, $r = -.65$ is a moderately large correlation, but does not remotely approach a level which would suggest the two constructs could be considered different measures of the same psychological state. The substantial differences in fit between the two-dimensional models and the unidimensional model for distress underscore this point. While these two distress dimensions appear to have similar stress antecedents, additional research is needed to identify other sources which the dimensions do not share (the existence of one or more of which is implied by the imperfect correlation of the two distress indicators) and to determine what outcomes, if any, they affect differently.

The G+S model did not fully explain stress-distress relationships. Two major areas of misfit between the model and the data involved perceived quality of life on the job and stresses

pertaining to financial matters. The relative importance of family and personal health concerns also may be poorly captured by a model which relies solely on general dimensions. One interpretation of these findings is that job quality, financial matters, and health concerns merit more detailed consideration in future studies. The general stress and distress dimensions do not fully capture the significance of these factors for sailors. At the same time, the ability to single out specific topics as disproportionately important for sailors indicates the utility of a general stress/distress model as a tool for identifying and understanding specific topics that stand out against the overall background of stress.

The present findings suggest the existence of a simple general model of stress and its effect on distress. The comments accompanying the rationale for this conclusion suggest several lines of investigation for future research. Other potentially constructive lines of development are implied by considering that the conclusions offered here are subject to several qualifications. First, only one demographic breakdown has been considered. Investigation of other demographic differences may reveal distinct models in different subgroups. For example, having a family might affect the amount and types of stress, the structure of those stresses (e.g., by introducing another causal factor), and the reactions to those stresses. Second, only two distress indicators were considered. Examination of a wider range of stress effects would be desirable to completely map the consequences of stress. Health outcomes and job performance are two important candidate outcomes for this type of extension. Third, only shipboard personnel were studied. Studying people in a wider range of Navy settings might reveal a more differentiated pattern of stress. Holding the environment constant in a study means that observed differences must appear to derive from differences between individuals [38]. The general dimension might, therefore, be less evident given a sample with a wider range of conditions (e.g., shore versus ship; ships returning from long cruises compared to ships in home port). The present structural model provides a solid starting place for more detailed investigation of these and related issues.

In conclusion, females and males aboard ships experience similar patterns of stress and react similarly to those stresses. Both genders can be represented by a single stress model. At present, the key element in that model appears to be a broad general tendency to experience many different stresses. Specific dimensions reflecting differences in living conditions and job stress are included in the model, but were not related to distress. The presence of a general stress dimension raises interesting questions about the nature of that dimension, but the most important immediate implication of the findings is that stress differences between female and male sailors are confined to any gender differences that may exist in the average levels of stress or variability of stress. The present analyses verify that prerequisite conditions for making meaningful comparisons between female and male sailors have been met. Differences in the average stress or distress levels, therefore, are interpretable. Those comparisons are the topic of a separate report in this series. Further research to clarify the sources of and consequences of the several stress dimensions could be useful for a variety of applications, including, but not limited to, the design of stress intervention programs, identification of individuals who are susceptible to stress-

related performance impairment, and the development of ship designs to reduce living conditions stress.

Notes:

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APPENDIX A

STRESS ITEMS

42. Think about your whole life over the past 2 weeks. On the whole, how much stress do you think is in your life right now.

43. Of the stress that you experience, how much comes from problems or concerns with:

a. Financial matters
b. My personal health
c. Personal or health matters of a family member
d. Being aboard ship
e. Crowded conditions aboard ship
f. My personal safety aborad ship
g. Maintaining personal hygiene aboard ship
h. My lack of privacy aboard ship
i. My inability to get enough exercise aboard ship
j. The lack of recreational activities aboard ship
k. My nutrition, the unavailability of desired foods aborad ship
l. The person I work for (my immediate supervisor)
m. The people I work with (my peers)
n. The people who work for me (those I supervise)
o. The way things are typically done aboard ship
p. The people with whom I share living space aboard ship
q. My ability to perform my duties
r. My career and chances for promotion
s. Being able to stay in the Navy because of downsizing or force reductions
t. My relationship with my spouse or boyfriend/girlfriend
u. Breaking up with my spouse or boyfriend/girlfriend because of being aboard ship
v. My ability to communicate with my family and friends
w. Adapting to life after I return fro this deployment
x. Feeling confined or trapped
y. My personal future and the meaning of my life
z. My use of alcohol
aa. Feeling isolated and excluded
bb. Feeling out of touch with the rest of the world
cc. My life as a whole
dd. *(If you have children)* My children because of being aboard ship
ee. *(If you have children)* Discipline of children
ff. *(If you have children)* child-care arrangements

APPENDIX G.10

Shipboard Women's Health Care: Health Care Provider Perceptions

LT Michael J. Schwerin, MSC, USNR

REPORT TOPIC AREA: SHIPBOARD WOMEN'S HEALTH CARE: HEALTH CARE PROVIDER PERCEPTIONS

LEAD AUTHORS: LT Michael J. Schwerin, MSC, USNR

ABSTRACT

Women have served aboard auxiliary U.S. Navy ships, as integrated members of the shipboard work force, since 1978. In 1994, women first started serving aboard combatant ships with the infusion of women into the work force of USS DWIGHT D. EISENHOWER (CVN-69). The provision of the highest standard of medical care for both men and women is a priority at all levels in the U.S. Navy. This study is a process evaluation from the perspective of shipboard health care providers. This evaluation was performed by conducting a personal interview with the senior health care provider of each of 32 ships where women are integrated members of the work force. Medical department representatives reported that most ships have training programs for birth control (90.6%), sexually transmitted diseases (96.9%), and Navy pregnancy policy (84.4%). Health care providers also reported perceived limitations in the lack of personnel and fiscal resources, gynecological training, and inadequate or inappropriate supplies (i.e., contraceptives, pregnancy tests, and sexually transmitted disease tests).

INTRODUCTION

A U.S. congressional mandate to the Department of Defense has called for research focused on the needs of women in the military [1]. A Tri-Service Defense Women's Health Research Program review committee has placed research focused on the health-care needs of women as a top priority [2].

As of August 31, 1995, approximately 8,033 women were serving aboard U.S. Navy ships, excluding hospital ships. Of those, approximately 19% of the female shipboard personnel in the U.S. Navy served aboard combatant ships, while 81% served aboard auxiliary ships [3]. The terms combatant ship and auxiliary (or noncombatant) ships are descriptions of the role a ship or class of ships may have in naval operation. Examples of combatant ships include aircraft carriers, battleships, cruisers, destroyers, frigates, submarines, and amphibious warfare ships. Examples of auxiliary ships include command ships, tenders (submarine and destroyer), ammunition, supply, fleet support, and repair ships [4]. Auxiliary ships replenish combatant ships with ammunition, stores, and fuel while they are underway. Because of their role as mission support, auxiliary ships and repair ships spend more time coordinating with supply centers in-port.

Hoiberg [5] examined major health-related issues among women in the Navy. She found that the majority of hospitalizations from 1974-1979 originated from pregnancy-related conditions. Elective abortion was identified as the most frequent pregnancy-related hospitalization condition,

while childbirth was identified as the second most frequent reason for pregnancy-related hospitalization. Hoiberg also found that female recruits had the highest hospitalization rates, as a group, across occupational field and pay grade.

In a subsequent examination of hospitalization rates among of Navy women, Hoiberg and White [6] note a change in health status. Hospitalization admissions for each of three cohort groups (i.e., 1973-1977, 1978-1982, and 1983-1987) were examined over a 4-year period. Results indicate that the highest hospitalization rates occurred for pregnancy-related conditions within each cohort group. Elective abortion in the 1978-1982 and 1983-1987 cohort groups decreased markedly, possibly due to the discontinuation of funding for abortions in federal inpatient medical facilities in 1978. Increases in pregnancy-related conditions (deliveries, complications from pregnancy, and spontaneous/other abortions) are attributed to changes in Navy policy, allowing female personnel to remain on active duty during and after their pregnancy. Overall, Hoiberg and White concluded that there are "many improvements to Navy women's health status and no major decrements" [6].

Sex differences among men and women in health-care utilization has been shown to exist in both civilian and military populations. In a civilian population, controlling for pregnancy health-care utilization and age, numerous studies have demonstrated that women utilize health care more often than men do [7-16]. In an examination of U.S. Navy shipboard personnel and their utilization of health care, Nice and Hilton [17] found that shipboard women utilize health care more often than men do, and that women in nontraditional occupations visited sick call significantly more often than did women in traditional occupations.

The purpose of this study was to produce a process evaluation from a phenomenological perspective of the perceived ability to provide adequate health care by shipboard medical departments on combatant and auxiliary U.S. Navy ships. Structured interviews were conducted with the senior medical department representative of each ship. Approximately half of the structured interview questions elicited qualitative responses. Due to the nature of qualitative data, conclusions from the author will be limited, allowing the readers to form their own conclusions concerning the significance of the findings.

METHOD

Subjects

Participants were U.S. Navy medical personnel serving aboard ship. The interview participant was the ship's senior medical department representative. The title of the interview participants included Senior Medical Officer (SMO), Medical Officer (MO), and Independent Duty Corpsman (IDC). A total of 36 health-care providers agreed to be interviewed. Four

interviews could not be used due to variations in the interview format that provided incomparable data. A total of 32 medical department personnel provided data for this study.

Twenty-six auxiliary and six combatant ships' medical departments provided data for this study. Ships included in these analyses spent an average of 67.25 days at sea (SD = 60.90) and 144.29 days in port (SD = 82.20). Medical departments reported an average caseload of 18 patients/day (SD = 15.51), of which approximately 7 were female (SD = 9.38).

Instrument

A standardized open-ended interview was divided into six sections: Human Resources, Fiscal and Equipment Resources, Automated Data Processing (ADP) Resources, Logs and Records, Morbidity and Incidence Data, Health-Care Provider Issues, and Training and Education/Health Awareness. The Human Resources section asked the health-care provider about the adequacy of the number of medical department personnel assigned to the ship. The Fiscal and Equipment Resources section asked about the adequacy of the medical department's budget, Authorized Medical Allowance List (AMAL), pregnancy testing, and any recommendations for AMAL changes to enhance the health care provided to women at sea. The ADP Resources section was designed to determine the level of utilization of the Shipboard Automated Medical System (SAMS) in medical departments. Logs and Records identified the nature of record keeping in medical departments. Morbidity and Incidence Data attempted to determine the total medical department daily caseload, female medical daily caseload, pregnancy testing and occurrence, sexually transmitted disease (STD) incidence, and medical evacuation (medevac frequency). Health-Care Provider Issues was designed to evaluate the medical departments' personnel feelings on their ability to provide adequate health care for their ships' female patient population. This includes the physical environment of the medical department, obstetrical and gynecological (OB/GYN) services, pregnancy testing, and contraceptive availability. The Training and Education/Health Awareness section was designed to provide information about the health training and education available aboard ship. Finally health-care providers were asked their "comments, concerns, and/or recommendations" and their opinion of the "major issues facing women aboard ship." The question asking for "comments, concerns, and/or recommendations" was asked once after the first half of the interview and again at the end of the interview.

Procedure

Interviewees were selected for participation based on their role as a health-care provider for male and female U.S. Navy personnel between the time period of May 1, 1995, through November 30, 1995. Participants were asked for their input as part of a larger shipboard health research survey. Six research associates conducted the interviews. Each of the interviewers has extensive knowledge of shipboard medical issues with an average of 13.8 yr. of U.S. Navy experience. Male interviewers conducted 23 of the interviews, while female interviewers

conducted the remaining 13 interviews. The research associates conducted the interview during a time convenient for the senior medical department representative. Interviews occurred in the medical departments aboard ship. The average interview time was approximately 56 min.

RESULTS

Responses to the dichotomous items concerning human resources, fiscal and equipment resources, ADP resources, and logs and records indicated a lack of satisfaction with the resources at the disposal of shipboard health-care providers. More specifically, more than one half of health-care providers reported that their human resources (56.3%) could not "adequately meet mission requirements." More than 40% of shipboard health-care providers reported that their budget (46.9%) and AMAL (43.8%) could not "adequately meet mission requirements." Shipboard medical departments did appear to have an AMAL designed specifically for women at sea (90.6%), adequate supplies for pregnancy testing (81.3%), and used SAMS (100%; see Table 1).

Table 1. Human Resources, Fiscal and Equipment Resources, Automated Data Processing Resources, and Logs and Records Responses, U.S. Navy Women Aboard Ship Study, 15 NOV 1995 - 31 JAN 1996.

CATEGORICAL RESPONSE ITEM	YES	NO	N/A
Do you feel your human resources are adequate to meet mission requirements?	43.8%	56.3%	00.0%
Do you feel your budget is adequate to support mission requirements?	53.1%	46.9%	00.0%
Is you AMAL adequate to support women's health-care needs?	56.3%	43.8%	00.0%
Do you have an AMAL designed specifically for women at sea?	90.6%	06.3%	03.1%
Do you have adequate supplies for pregnancy testing?	81.3%	15.6%	03.1%
Is SAMS being used by medical?	100.0%	00.0%	00.0%

When asked, "What, if any, recommendations have you made for AMAL changes to enhance your ability to diagnose and treat women more effectively?," shipboard health-care providers primarily responded with requests for additional Depo-Provera [4] and a greater variety of birth control pills (BCPs, 9). Many were concerned with the efficacy of pregnancy and STD test kits (see Appendix A).

For the midsurvey question, "Comments, concerns, and/or recommendations," health-care provider concerns centered around pregnancy-related issues (e.g., pregnancy testing and personnel issues if a crew member becomes pregnant; see Appendix B).

Responses to dichotomous items concerning provider issues indicated that health care for females appears to be perceived as adequate while birth control supplies and pregnancy testing appear to be inadequate. The adequacy of privacy for females in medical (78.1%), availability of standbys (94%), and somewhat adequate gynecological training of health-care providers (81.3%) and possession of diagnostic equipment (75%) would support the notion that medical departments aboard ship are providing adequate health care. When asked if medical departments had an adequate supply of contraceptives, 62.5% answered "yes." Few medical departments (9.4%) said they conduct pregnancy tests upon the arrival of female shipboard personnel, while 15.6% said they conduct pregnancy tests prior to extended deployments (see Appendix C). A chi-square test of significance was utilized to test for significant differences in responses due to the title and rank of the respondent. Of all comparisons between the title and rank of the respondents and their perception of their ability to provide health care, only the item asking, "Do you feel you have been adequately trained to perform GYN exams and treat common female specific problems?" produced a significant difference (chi-square = 6.86, df = 1, $p < .01$). Perceived adequacy of gynecological training was dependent on rank and title, whereby MOs reported feeling better prepared to perform gynecological exams and treat common female-specific problems than did IDCs and senior enlisted corpsmen.

Health-care providers listed the contraceptives available to shipboard personnel and ranked the three most-requested contraceptives from medical departments. Condoms, Depo-Provera, Norplant, BCPs, foam, surgical intervention, diaphragms, and intrauterine devices (IUDs) were available at varying levels in medical departments aboard ship. When asked to rank the most requested contraceptives, health-care providers reported condoms, Depo-Provera, and BCPs as most frequently requested, with BCPs the most requested of the three (59.4%; see Table 2).

Table 2. Health-Care Provider Issues: Contraceptives Available, Top 3 Contraceptives, U.S. Navy Women Aboard Ship Study, 15 NOV 1995 - 31 JAN 1996.

CONTRACEPTIVE AVAILABILITY	YES	NO	N/A	% #1 VOTES	% #2 VOTES	% #3 VOTES	% NO VOTES
Condom	100.0	00.0	00.0	31.3	25.0	40.6	03.1
Depo-Provera	93.8	06.3	00.0	09.4	46.9	31.3	12.5
Norplant	31.3	65.6	03.1	----	----	----	----
Birth Control							
Pills	96.9	03.1	00.0	59.4	25.0	12.5	03.1
Foam	12.5	87.5	00.0	00.0	00.0	00.0	00.0

Surgical							
Intervention	12.5	87.5	00.0	00.0	00.0	00.0	100
Diaphragms	56.3	43.8	00.0	00.0	00.0	00.0	100
Intrauterine							
Device (IUD)	09.4	90.6	00.0	00.0	00.0	00.0	100

When asked about the amount and type of training provided aboard ship, health-care providers reported that educational in services were conducted more frequently for STDs (96.9%) and birth control methods (90.6%), while Navy pregnancy policy (84.4%) and health promotion (75%) received relatively less emphasis. Similarly, handouts were made available most frequently for birth control methods (68.8%) and STDs (65.6%), and less so for health promotion (50%) and Navy pregnancy policy (40.6%; see Table 3).

Table 3. Training and Education/Health Awareness, U.S. Navy Women Aboard Ship Study, 15 NOV 1995 - 31 JAN 1996.

TRAINING AND EDUCATION TOPIC	% "YES" FOR INSERVICES	% "NO" FOR INSERVICES	% "YES" FOR HANDOUTS	% "NO" FOR HANDOUTS
Birth control methods	90.6	09.4	68.8	31.3
Sexually transmitted diseases	96.9	03.1	65.6	34.4
Health promotion	75.0	25.0	50.0	50.0
Navy pregnancy policy	84.4	15.6	40.6	59.4
Other	15.6	84.4	15.6	84.4

Responses to the question, "What do you feel are the major issues facing women aboard this ship?," appeared to touch on a number of concerns. Most respondents [8] reported that gynecological care, pregnancy, and STDs were the dominant issues facing women aboard ship, while others suggested that barriers to providing adequate health care [5], crew member immaturity [5], and female berthing [4] were prevalent problems (see Appendix D).

For the final question eliciting "Comments, concerns, and/or recommendations," most respondents who offered an opinion noted medical treatment barriers [4] as well as the need for medical personnel to provide psychological counseling (3; see Appendix E).

DISCUSSION

A limitation of this study is the marginal imbalance of response between auxiliary and combatant ships, of the interviews included in these analyses, 26 (81% of total sample) were auxiliaries and 6 (19%) were combatants. Currently, 98 ships include women among crew members, 69 (70%) auxiliary, and 29 (30%) combatant (Bureau of Naval Personnel, 1995). Although these ratios of combatant to auxiliary (or noncombatant) seem only minimally imbalanced, caution still should be used when generalizing from these data. Future studies intend to examine responses by ship type (auxiliary vs. combatant).

In terms of medical planning for health-care utilization, the distinction between combatant and auxiliary may be a significant factor. Although the health-care needs of shipboard women are the same, the availability of supplies is somewhat different. Usually, auxiliary ships have greater access to mission-essential supplies (i.e., fuel, ordnance, medical supplies) due to the nature of their role--supply and support. Combatant ships tend to spend more time in a fully operational setting and rely on supply ships for support. This difference would, however, only assist in understanding problems encountered in the provision of medical supplies.

General findings from this study suggest an increased and more varied supply of contraceptives, pregnancy testing, and STD resources, and improved gynecological training of enlisted health-care providers might substantially improve the quality of health care aboard ship. Specifically, health-care providers reported a need for increased supplies of Depo-Provera, greater variety among BCPs, and more accurate pregnancy and STD testing kits. Additionally, a more-thorough screening (medical and psychological) of shipboard personnel, both male and female, might decrease the strain associated with issues that are somewhat peripheral to the primary mission of shipboard medical departments (e.g., psychological counseling).

Notes:

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"What, if any, recommendations have you made for AMAL changes to enhance your ability to diagnose and treat women more effectively?"

Inadequate supply of birth control/pills (n = 13).

- Increase Depo-Provera in the AMAL (3).
- Depo-Provera. Prevention or pregnancy dose on AMAL instead of endometriosis dose. Need chlamydia tests. Stock not adequate to meet needs.
- BCPs are not on AMAL.
- Window of choice of BCPs on AMAL.
- Requested a change in AMAL BCPs.
- For BCPs, triphasic BCPs need to be included.
- Want additional BCPs included on AMAL. Need to be issued more Depo-Provera. It is on AMAL but we don't have enough quantities to accommodate women. BCPs that are authorized on AMAL are not the products preferred/requested by women.

"What, if any, recommendations have you made for AMAL changes to enhance your ability to diagnose and treat women more effectively?"

- More variety of BCPs. I only carry Ortho Novum 777. Any other varieties I get have to come from procurement as a non-AMAL item. It just becomes an inventory nightmare.

  Clinics are not always supportive to supplement stock.
- Ortho Novum 150 and Triphasal.
- The quantities of certain items are not adequate. Not enough varieties of BCPs.
- There're a lot of pharmaceuticals that we don't use. Need Ortho Novum 777, Triphasal -- hospitals get all the updated pills but we don't get them.

No change/response (n = 11).

- When the full complement of women arrive, they will be better able to assess adequacy.
- No - changes that are needed are in the process.
- No comment made (9).

"What, if any, recommendations have you made for AMAL changes to enhance your ability to diagnose and treat women more effectively?"

Pregnancy/STD testing (n = 4).

- Recommended increasing pregnancy test in AMAL and switching to a different brand of test kit.
- Reliability and ease of use of pregnancy test kits need greater emphasis in selection process.
- Pregnancy tests are inadequate, birth control selection is outdated.
- Onboard testing for chlamydia.

Miscellaneous medical supplies (n = 4).

- Have not yet been approached. When approached will recommend a thorough cost analysis of pharmaceuticals.
- More injectable antibiotics to use with a physician's order.
- Ultrasound.
- Ceucmin cream should be added to the women's AMAL.

"Comments, concerns, and/or recommendations" Midsurvey question

No comment offered (n = 21).

Pregnancy-related issues (n = 5).

- Increase in number of women coming to sick call prior to going underway. Many come to medical to make certain pregnancy status.
- The capability of caring for a ruptured ectopic pregnancy is very anxiety-provoking while at sea.
- Medical officer is concerned about losing a female corpsman due to pregnancy and insists that ship needs a female corpsman.
- Most women procure their own pregnancy test kits and use ship's medical to confirm.
- We need to standardize pregnancy test kits. When go to vendor, they're expired, the backload is too great. Usually we go to the company. Problem is getting this into the system to make it available. Want to get away from stockpiling due to problems with expiration.

"Comments, concerns, and/or recommendations" Midsurvey question

SAMS/supply problems (n = 3).

- The major concern onboard, from a medical standpoint, is supplies and the length of time from requisition to arrival. This is a continuing problem. Physician feels problem would be best addressed by allowing medical to procure all medical supplies.
- Would like supply to interface with SNAP II in SAMS.
- SAMS is inadequate and not user friendly.

"People" issues (n = 3).

- A lot of young women present themselves to sick call with emotional concerns and express a desire to get orders off the ship. This takes a lot of time providing counseling.
- Too many people are sent to ships who are not fit for shipboard life. These people cause a lot of time to be spent on them and create administrative problems.
- Women are seen almost (by medical) almost twice as much as men.

Appendix C

HEALTH-CARE PROVIDER ISSUES: CATEGORICAL RESPONSE ITEM	"YES"	"NO"	"N/A"
When examining female patients, does the layout of your facility allow for adequate privacy?	78.1%	21.9%	00.0%
Is you staff able to provide female standbys for female patients?	93.8%	06.3%	00.0%
Are nonmedical females routinely used as standbys?	21.9%	75.0%	03.1%
As a provider, do you feel you have been adequately trained to perform GYN exams and treat common female-specific problems?	81.3%	15.6%	03.1%
As a provider, do you have the diagnostic equipment that you need to diagnose illnesses in women?	75.0%	21.9%	03.1%
Do you have adequate supplies to conduct Pap smears?	71.9%	18.8%	09.4%
Have there been occasions, while deployed, that you have had to medically transfer female patients to an increased echelon of care?	53.1%	40.6%	06.3%
In these cases of medical transfers, were there any female patients transferred because of inadequate supplies, equipment, or medical expertise?	37.5%	28.1%	34.4%
Is your supply of these contraceptives (condoms, Depo-Provera, Norplant, BCPs, foam, diaphragms, IUDs) adequate?	62.5%	37.5%	00.0%
When women report aboard on permanent change of station, is pregnancy testing a routine part of the check-in procedure?	09.4%	90.6%	00.0%
Are women tested for pregnancy, prior to an extended deployment, as routine protocol?	15.6%	71.9%	12.5%

"What do you feel are the major issues facing women aboard this ship?"*

OB/GYN, STDs, and birth control (n = 8).

- Availability of specialized OB/GYN services.
- Access to OB/GYN health care ashore.
- Trying to provide adequate health care. Treatment for prolonged GYN problems. When women get sick they get really sick. Don't have accessibility to GYN care.
- STDs, keeping Pap current.
- STDs and pregnancy.
- Pregnancy (3).

Personal immaturity (n = 5).

- Maturity, responsibility in personal and professional matters.
- Maturity level low.
- General maturity level of both men and women in terms of women as equal workers.
- Age of the women (18-22). First ship, first time away from home. They seem to be trying to find their identity and independence, frequently leading to poor judgment calls.
- Psychological immaturity. Need to be accountable for actions.

"What do you feel are the major issues facing women aboard this ship?"*

Barriers to providing adequate health care (n = 5).

- Patient/health-care provider relationship becomes an issue. Some women do not or hesitate visiting sick call because they see and work with the health-care provider in personal and professional settings.
- Not having a female corpsman aboard has prevented some females from going to sick bay.
- Lack of privacy and ship's schedule makes it difficult for women to be examined.
- Confidentiality.
- Must have a female in the medical departments.

Inadequate berthing (n = 4).

- Berthing, privacy.
- Berthing accommodations.
- Berthing is not adequate.
- Female berthing--major problems. Fifty women sharing 2 showers and 4 toilets.

"What do you feel are the major issues facing women aboard this ship?"*

Miscellaneous: Gender issues (n = 3).

- Gender identity/job performance.
- "No dating" policy. I feel it should be strictly enforced. Dating among sailors impacts and interferes in unit moral and therefore interferes with mission requirements.
- Child care, especially for single women.

Personnel issues (n = 2).

- Results of positive pregnancy on career plans.
- Loss of personnel after pregnancy. Billets being gapped.

No comment offered (n = 4).

* One survey did not contain this question; N = 31.

"Comments, concerns, and/or recommendations" Final survey question

No comment offered (n = 19).

Treatment barrier (n = 4).

- Would like more training in dental emergencies.
- AMAL insufficient. Needs a complete review. Need more emergency-care training on care for women.
- Recommend that medical (areas) be off limits to all unauthorized personnel.
- Major concern: our limited capability to provide standard of care. Recommend more aggressive physical screening/standards for both male and female personnel prior to being assigned to ships. Also would like to see provider with experience in GYN assigned to deployed ships.

"Comments, concerns, and/or recommendations" Final survey question

Miscellaneous: Personnel comments (n = 4).

- Generally speaking, the women have had a positive influence on the command.
- Junior personnel should not be assigned to shipboard duty--not mature enough.
- A lot of Sailors of the Quarter are female. A problem that males and females alike are not ready to be adults.
- Plans to start and maintain a vigorous birth control, pregnancy awareness, and STD avoidance program onboard.

Crew psychological concerns (n = 3).

- Sexual abuse is a major issue with most of the women who have reccurring difficulties and end up in medical. At least 50-60% of our patients have significant issues. It is overwhelming. We do not have the resources to help these people. Let's admit that most of the young women in the Navy are running from something--mostly abusive situations.

- A majority of our referrals for suicidal ideation (and other psych evaluations) are female, and most of them report that they've been unhappy since boot camp or enlisted for the wrong reasons (to please parents).
- Psychological referrals for social adjustment problems are the main medical problem aboard the ship.

Miscellaneous: Medical comments (n = 2).

- Had quite a few spontaneous abortions around time of deployment.
- Feels that the ship receives excellent, responsive support from the nearby clinic.

APPENDIX G.11

Pregnancy Among Enlisted Women Aboard Ships

Marie D. Thomas, Ph.D. and Patricia J. Thomas, M.A.

REPORT TOPIC: PREGNANCY AMONG ENLISTED WOMEN ABOARD SHIPS

LEAD AUTHORS: Marie D. Thomas, Ph.D., and Patricia J. Thomas, M.S.

ABSTRACT

Demographic correlates of pregnancy, and pregnancy rates, outcomes, and planning, were studied in a sample of 2,032 Navy enlisted women. Survey data were weighted to reflect the distribution of pay grades within the ships' population of women. The pregnancy rate was significantly below previously reported rates for Navy women, and was related to age. Women who became pregnant while assigned to a ship were more likely than those assigned to shore to report that their pregnancy had been unplanned.

INTRODUCTION

Prior to 1972, military women who became pregnant were involuntarily separated from the service. This policy was first amended to allow for retention of specific women on a case-by-case basis, and abandoned altogether in 1975 after several challenges to its constitutionality [1]. Currently, Navy policy states that "requests for separation will not normally be approved unless there are extenuating circumstances or the request otherwise complies with criteria for separation" [2].

Since 1979, women have been permitted to serve in Navy support ships. Because of chemical and structural hazards in shipboard environments, policies were enacted to protect pregnant women and their unborn children. By the twentieth week of gestation, pregnant women must be transferred ashore, although medical personnel or the commanding officer can cause this change to occur earlier. In addition, pregnant women cannot deploy with their ship, regardless of their stage of pregnancy.

The growth in the number and roles of women in the Navy that occurred after the 1970s led to concern over the potential impact of pregnancy on mission accomplishment. Although Navy women's pregnancy rates were congruent with the rates of their civilian age cohorts [3], charges were made that pregnant women incur an undue amount of absenteeism, cause others to work harder and longer because of the limitations on the pregnant service member's duties, and impact negatively upon the cost of various personnel systems. Research conducted to evaluate each of these suppositions supported the policy of retaining women who become pregnant [4, 5, 6].

In November 1993, the section of the Federal Code that prohibited women's assignment to combat ships was voided. Because of the demanding operational tempo of these ships and their role in national defense, pregnancy among women at sea took on renewed salience. The competing needs of military readiness and women's reproductive health required that issues

associated with contraceptive behavior and pregnancy be included in the Women Aboard Navy Ships Comprehensive Health and Readiness Research Project conducted at the Naval Health Research Center in San Diego, California. This paper reports on the pregnancy related data collected through this study, including demographic correlates of pregnancy; and pregnancy rates and planning.

Literature Review

The relationships between demographic variables and pregnancy among civilian women of child-bearing age are well documented [7]. Research with military populations has found fewer correlates, however. For example, there is no relationship between race and pregnancy among Navy women in their first enlistment [8]. The greater homogeneity of military women than civilian women is partially responsible for these results. Like civilian rates, however, military pregnancy rates are strongly related to age (and, by definition, pay grade). Moreover, Navy research on women aboard ships has demonstrated that their pregnancy rate is lower than that of women assigned ashore, despite perceptions to the contrary [9].

Pregnancy outcomes were investigated in large-scale surveys conducted by the Navy in 1988, 1990, and 1992 [9]. The findings indicated that military abortion rates were lower than those reported for civilians in the 20- to 40-year-old age group. However, miscarriage rates were high, particularly among E-2 and E-3 women. A follow-on study of reproductive outcomes used data for active duty women hospitalized for pregnancy/childbirth between 1982 and 1992 in a Navy treatment facilities [10]. No relationship was found between duty station or rating and pregnancy outcome. However, Navy women had higher rates of spontaneous abortions and ectopic pregnancies than their civilian age cohorts, despite the fact that miscarriages of Navy women would have been greatly undercounted (i.e., because they do not result in hospitalization).

A related study compared pregnancy risk variables and outcomes in active duty and dependent working wives at an obstetrical clinic in a Navy hospital [12]. The results indicated that active duty women worked longer hours and later into their pregnancies than did the civilians. Military women also reported a lower level of social support than the working wives, yet there was no difference in birth weight or gestational age of the infants of the two groups.

Pregnancy planning (or lack of) also has been investigated in Navy surveys and in interviews with pregnant enlisted women. A consistent finding is that over half of the pregnancies of enlisted women are unplanned. This figure is much higher for women in the lowest pay grades; typically about 70% of the pregnancies in E-2 and E-3 women are not planned. Slightly over half of all unplanned Navy pregnancies are contraceptive failures [10]: the women said they were using birth control, primarily contraceptive pills or condoms.

METHODOLOGY

The multi-year Women Aboard Navy Ships Comprehensive Health and Readiness Research

Project utilizes several data collection methods. Only survey items that focused on pregnancy were analyzed for this paper.

Survey Development and Administration

Several methods were used for the development of the U.S. Navy Shipboard Health Survey that was utilized in this study, including the following: 1) review of extant questionnaires, literature, and standard scales, 2) convening of a panel of subject matter experts, 3) elicitation of major issues from knowledgeable sources, and 4) review of Navy requirements concerning the reporting of women's health and access to health care. Some of the pregnancy questions were taken from a Navy survey that was administered in 1988, 1990, and 1992 to track rates of pregnancy and single parenthood [3]. Other pregnancy questions were developed specifically for this study.

Whenever possible, the survey was administered in a common area aboard ship. Subjects were briefed on the study, asked to sign an informed consent form, and completed the survey in the presence of research staff. When shipboard activity precluded gathering the subjects together, the surveys were distributed for completion in work spaces. Members of the sample were provided envelopes for their completed surveys, which were sealed and collected by a researcher.

Sample

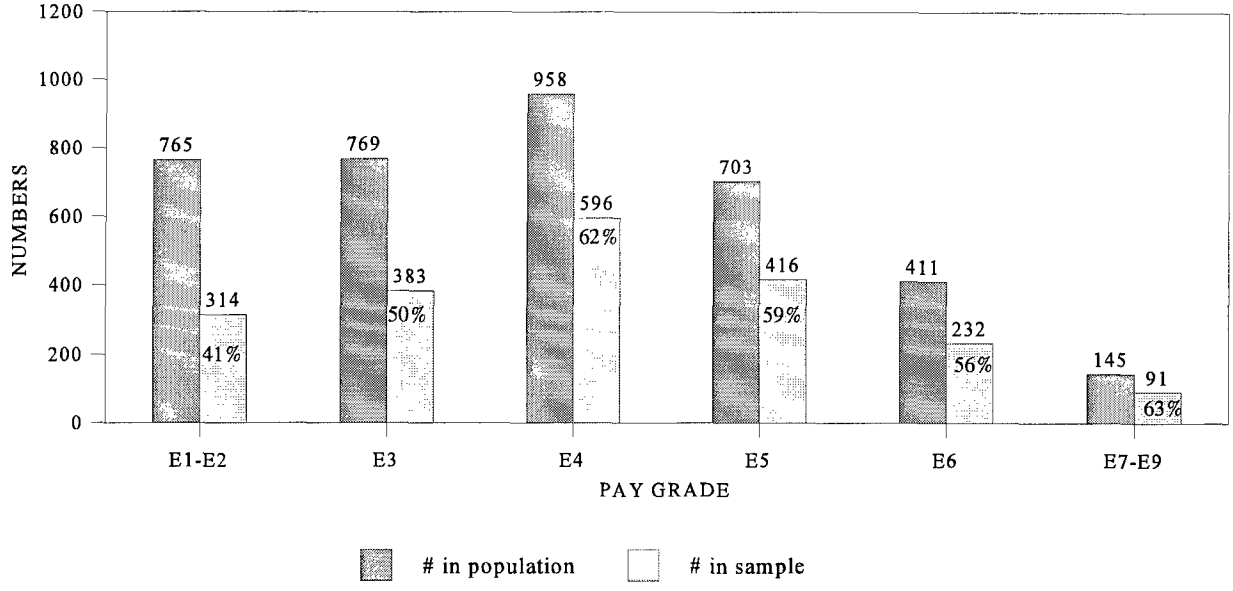
All women serving aboard U.S. Navy ships were eligible for inclusion in the survey sample in Year 1 of the research. Twenty-two of the 74 ships that had women in their crews in 1995 were surveyed during the first year, based on their availability as determined by the commanding officer and medical department. The population of women in these ships numbered 3,751.

The overall median response rate for women in the 22 ships was 67%. Participation rates varied by the number of women serving aboard. Ships with fewer than 100 women assigned had a median female response rate of 78% compared to ships with more than 100 women assigned, which had a median female response rate of 51%. There were 2,068 women in the sample. The analyses for this paper were based on only the 2,032 women who indicated their pay grade in the survey.

Data Weighting

As shown in Figure 1, the sample was not representative of the population with regard to pay grade, because different percentages of women in each of the pay grades (ranging from 41% to 62%) completed the survey. Women in the lower pay grades (E1-E3) were under represented in the sample, while E-4 and above women were slightly over represented. For example, E-1/E-2 women comprised 20% of the population, but only 15% of the sample.

Figure 1. Enlisted women in surveyed ships: population and sample, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.



Because pregnancy rates and contraceptive behavior are significantly related to pay grade, the data were weighted so that responses would accurately reflect the proportions of women in each pay grade within the population aboard these ships. The procedure for calculating weights is simple [13]. Each pay grade's proportion in the population and its proportion in the sample were determined. The population proportion was divided by the corresponding sample proportion to provide a weight for each pay grade. Pay grades under represented in the sample with respect to the population had weights greater than 1.0, while pay grades over represented in the sample had weights less than 1.0. When the weights were applied to response option frequencies, they increased the "influence" of women in the lower pay grades, and gave less weight to the responses of E-4 and above women. A weighted data file was created using the Statistical Package for the Social Sciences. When analyses were run, the weights were automatically applied to the number of events in a response option. It is important to note that the weighting process only affects statistics that are collapsed over pay grade (such as overall pregnancy rate); individual pay grade percentages should not change. Due to rounding error, however, individual pay grade percentages may be slightly different from the percentages calculated from unweighted data

Statistical Analyses

Mean differences were examined using two-tailed Student's *t* tests. Differences in proportions were analyzed by chi-square tests and *z* ratios. Pearson product-moment correlations also were computed. The .01 probability level was adopted for all significance tests.

RESULTS

Pregnancy History

Half of the women in these ships had never been pregnant, and 28% had been pregnant more than once. Table 1 shows that the majority had no children. The mean number of live births for those who had given birth was 1.58.

Table 1. Responses to Pregnancy History Items, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

HOW MANY TIMES HAVE YOU BEEN PREGNANT?	
Never	48%
Only once	24%
Twice	14%
More than two times	14%
HOW MANY LIVE BIRTHS HAVE YOU HAD?	
None	54%
One	26%
Two	15%
More than two	5%

Current and Annual Pregnancy Rates

The current pregnancy status of women in the sample was highly related to their pay grade ($X^2(8, N = 1,594) = 34.75, p < .001$). As shown in Table 2, 5% of the enlisted women aboard the ships were pregnant at the time of the survey, and an additional 4% were not sure whether they were or were not pregnant. The pregnancy rate obtained with this sample is significantly below the Navy point-in-time pregnancy rate of 8.6% for a representative sample of enlisted women ($X^2(1, N=4069) = 11.89, p < .001$) [3]. In this earlier study, the pregnancy rate among women who had been assigned to sea duty when they became pregnant was 6.8%.

Because only 73 women in the current sample were pregnant at the time of the survey, most of the analyses were performed on women who had been pregnant in the past 12 months (N = 185) or those who had ever been pregnant while in the Navy (N = 649).

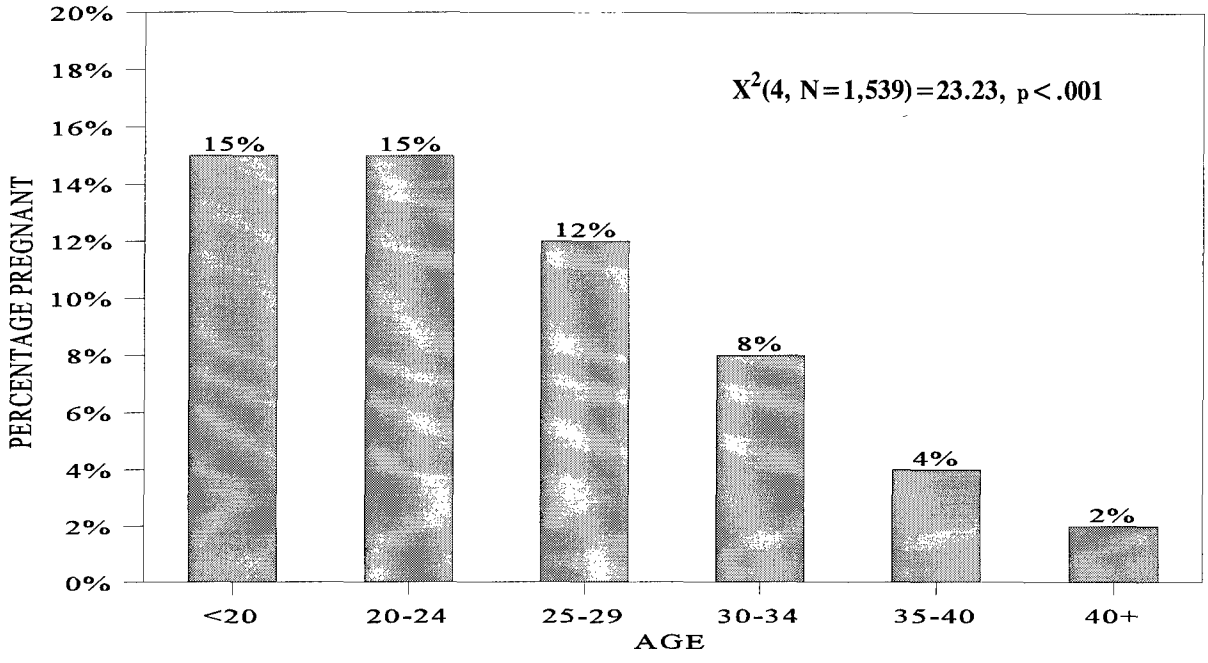
Table 2. Percentage of Women Who Were Pregnant When Surveyed, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	PERCENTAGE		
PAY GRADE	**No**	**Yes**	**Don't Know**
E-1 - E-2	84	8	8
E3	92	4	4
E4	89	6	5
E5	95	2	3
E6	95	3	2
E7 - E9	100	-	-
Total	91	5	4

For obvious biological reasons, pregnancy is correlated with age. Figure 2 shows the annual pregnancy rates for enlisted women in the sample by age group. These rates are based on responses to the question, "Have you been pregnant during the past 12 months?" The federal government does not keep records of pregnancy rates, but reports birthrates in the United States by numerous demographic variables. Civilian women aged 25 to 29 years have the highest annual birth rate (11.8% in 1991) [14] followed by those 20 to 24 years of age (11.6%). Thus, the estimated birthrates for women 20 to 24 years and 25 to 29 years old in this sample are somewhat below the national values.

The relationships between being pregnant during the past 12 months and several demographic variables were investigated. Level of education attained, marital status, and race were not significantly related to pregnancy during this period.

Figure 2. Annual pregnancy rate of shipboard women by age, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.



Pregnancy Planning

The women were asked a series of questions about previous pregnancies--whether they were in the Navy at the time, the approximate date of live birth or fetal death, duty location, and use of birth control. Responses to items concerning the most recent pregnancy, other than a current pregnancy, were analyzed to investigate factors associated with pregnancy planning. Only pregnancies that had occurred while in the Navy were used in this analysis.

About 60% of the previous pregnancies had not been planned (see Table 3). This proportion is very similar to what has been reported for other samples of Navy enlisted women (3, 10). There was a significant relationship between planning to have a child and duty location. Almost three-fourths of the pregnancies that occurred among Navy women assigned to ships were accidental, as compared to 55% of the pregnancies of shore-based women. Women who had unexpected pregnancies were significantly younger than those who had planned to have children.

Table 3. Comparison of Maternal Age, Duty Location and Outcome of Planned and Unplanned Pregnancies, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	PREGNANCY PLANNING		SIGNIFICANCE TESTING
	PLANNED	UNPLANNED	
	(39%)	(61%)	
Mother's Mean Age (years)	25.9	24.1	$t = 4.84$ *
Duty Location			
Ship	29%	71%	
Shore Station	45%	55%	$X^2 = 14.45$ *
Outcome of Pregnancy			
Live Birth	90%	64%	
Abortion	-	21%	
Adverse Outcome	10%	16%	$X^2 = 64.99$*

* $p < .001$

Pregnancy outcome also differed significantly as a function of pregnancy planning. Only 64% of the unplanned pregnancies resulted in a live birth, as compared to 90% of the planned pregnancies. Part of the difference was due to abortions among the former group. However, the greater number of adverse outcomes among women who had not planned their pregnancies was also noted.

Figure 3 shows the relationship between pregnancy planning and pay grade. All of the E-1 and E-2 personnel who had become pregnant while in the Navy stated that they had not intended to do so. As pay grade increased, unintended pregnancies decreased (with the exception of E-7 and above).

Women whose most recent pregnancy was unplanned were asked if they had been using birth control at the time of conception. Forty-three percent had been practicing contraception, a proportion identical to the contraceptive failure rate of civilian women who experienced an unplanned pregnancy [15]. Age and pay grade were unrelated to contraception failure.

Abortions

Analyses were performed of the percentage of abortions among the most recent pregnancies of the women in the sample. The demographic questions at the beginning of the survey referred to current information (e.g., marital status, pay grade) and could not be used as independent variables with a prior event. However, age could be computed from the year in

which the pregnancy occurred, and sea/shore assignment at the time of conception was also available.

Figure 3. Percentage of pregnancies that were unplanned by pay grade, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

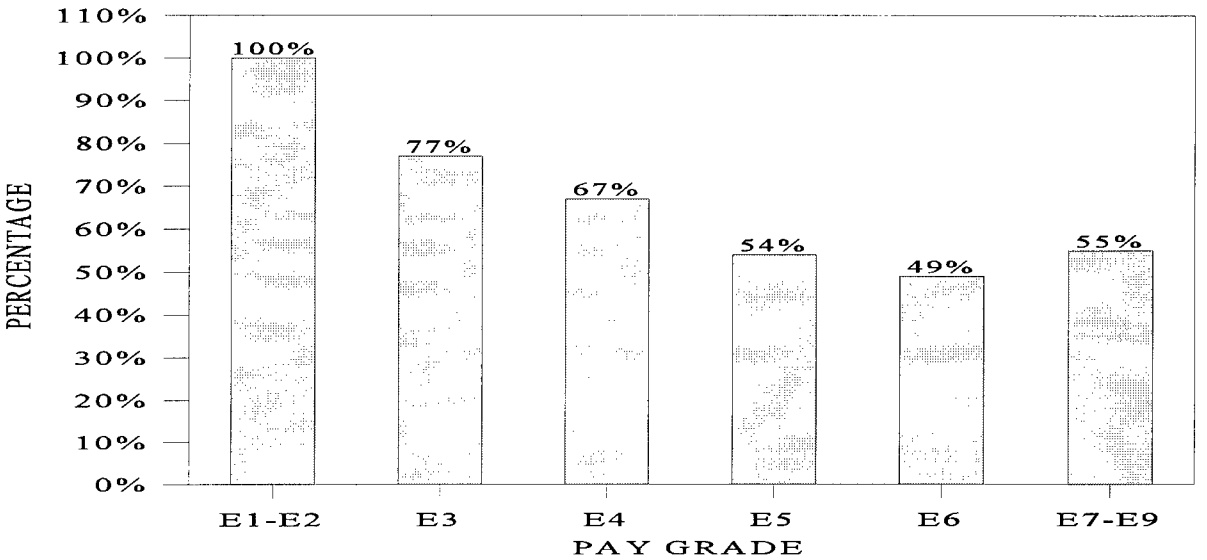


Table 4 shows that women 25-29 years old assigned to ships at the time of conception had higher rates of induced abortion than those assigned ashore. The youngest women (those under 20) had the highest rates of abortion and adverse outcomes of the women in the sample.

Table 4. Percentage of Most Recent Pregnancies Resulting in Induced Abortions, by Assignment Location and Age, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	PERCENTAGE RESULTING IN INDUCED ABORTION	
AGE	SEA	SHORE
less than 20	23	27
20-24	16	13
25-29	20	6
30-34	5	6
35 or older	-	9
Total	17	10

Probability of Becoming Pregnant

The respondents were asked, "What is your best estimate of the likelihood that you will become pregnant in the next 12 months?" The scale to be used in responding to this question

ranged from 0 to 100. Overall, 66% of the sample indicated zero chance, 14% said less than a 50% chance, and 20% said greater than 50% chance. The relationship between pay grade and pregnancy probability was significant. Women who were in pay grades E-6 and above were the most emphatic about not becoming pregnant (82%).

Table 5. Probability of Becoming Pregnant in Next 12 Months, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	PERCENTAGE		
PAY GRADE	**NONE**	**1% to 49%**	**50% to 100%**
E-1 & E-2	57	18	25
E-3	61	17	22
E-4	62	16	22
E-5	73	9	18
E-6	78	11	11
E-7 to E-9	95	1	4
TOTAL	66	14	20

Note. X^2 (8, N = 1,831) = 65.45, $p < .001$

Table 6 shows the correlations between the responses to this question and some of the demographic variables. The strongest (though small) relationships were with number of children, age, and pay grade, all of which were negative. Seventy-three percent of the women who had ever had a child indicated that there was no chance that they would become pregnant within the next year (as compared to 62% of those who had never given birth). The number of times a woman had been pregnant also was negatively correlated with probability of becoming pregnant within the next 12 months, whereas the number of pregnancies while in the Navy was not significantly related to the dependent variable.

Table 6. Correlations Between Pregnancy Probability and Demographic Variables, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

VARIABLE	**CORRELATION**
Number of children	-.13**
Age	-.13**
Pay grade	-.12**
Number of pregnancies	-.09*
Number of Navy pregnancies	-.05

* $p < .001$
** $p < .01$

The relationships of education and race with pregnancy probability were also investigated. The X^2 value for race was not statistically significant. However, education was related to the probability of becoming pregnant ($X^2(6, N=1,827) = 19.92, p < .01$)--the higher the level of education, the less probability that a pregnancy would occur.

DISCUSSION

The pregnancy rate among the women in this sample was significantly below what has been reported for representative samples of women in the Navy. Women in ships typically have a lower point-in-time pregnancy rate than women ashore, but this sample yielded a rate lower than previously has been found for women afloat. One explanation may be that many of the ships in this sample were combat or combat logistics ships, whereas prior rates were obtained from women in destroyer and submarine tenders. Although both types of ships were represented in the present sample, the small number of women who were pregnant (5%) precluded drawing conclusions about the effect of ship type on the rates.

As found in prior Navy and civilian research, annual pregnancy rates were related to age. Unlike what has been reported in the civilian literature, they were not significantly related to race, marital status, or education. African-American women in the U.S. population have a much higher birthrate than white women [14]. However, the selection process that occurs prior to enlistment or organizational adaptation, appears to result in a group of African-American women entering the Navy whose reproductive behavior is more similar to that of their white peers than to that of African-American civilians. Navy women are a relatively homogeneous population with respect to education and age, at least in comparison to women of child-bearing age in the United States.

The majority of the most recent pregnancies of the women in the sample were unplanned. The proportion of unanticipated pregnancies was particularly high among women E-3 and below. When asked what was the probability that they would become pregnant within the next 12 months, 23% of the E-1 to E-3 women indicated that the chance was 50% or greater. It is impossible to determine from these data the extent to which this estimate is based on past experience (i.e., previous unplanned pregnancy) or intention to become pregnant. However, it is to some extent realistic, since their rate of actual pregnancies is higher than that of E-4 and above.

Unplanned pregnancy was also associated with sea/shore duty assignment. The fact that women who planned their pregnancies are more likely to do so while assigned to a shore command is good news for the Navy. Although Navy policy states that pregnancy and parenthood are compatible with a naval career, it also reminds personnel of their obligations to the military. Becoming pregnant while assigned ashore is a more responsible behavioral outcome than becoming pregnant while assigned to a ship.

Women who experienced an unplanned pregnancy represent a target of opportunity for interventions designed to reduce the incidence of such events. Women who become pregnant

accidently tend to be young and in the lowest pay grades, indicating that they are probably least able to cope with the expense of parenthood and the problems of juggling motherhood and a job. Women who did not plan their pregnancies also are more likely than those who did plan to suffer an adverse outcome. Thus, from the perspectives of individual health and military readiness, reducing the number of unplanned pregnancies makes sense.

The shipboard environment appears to pose some degree of hazard for pregnant women. This finding was particularly noted among women in the 25 to 29 year old group. Since this analysis, of necessity, was based on a prior pregnancy, the relationship of an adverse outcome to other health factors measured in the survey was not relevant. Because this research project is longitudinal and includes gathering detailed medical information on the women in the sample, it will be possible to investigate the role in fetal death of factors other than age among women in ships.

Two-thirds of the women in the sample predicted that the probability of their becoming pregnant in the next 12 months was zero. It has been suggested that women who have had one child while in the Navy are more likely to become pregnant again than are childless women to have a first pregnancy. The reasoning behind this supposition is that mothers have learned how to simultaneously manage parenthood and a career, and that they enjoy the benefits available to Navy families. Analysis of these data support an opposite hypothesis. Women who had a child were significantly less likely than childless women to report they would become pregnant. The group that was most likely to become pregnant was women who were in pay grades E-3 and below.

Personnel assigned to ships, particularly combatant ships, have a responsibility to the Navy and the country to remain fit for duty. The relatively low pregnancy rate among women in this sample suggests that they accepted that responsibility.

Notes:

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APPENDIX G.12

Women Aboard U.S. Navy Ships: Life Style Behaviors and Health Promotion Issues

Terry L. Conway, Ph.D., Frank C. Garland, Ph.D.

REPORT TOPIC AREA: WOMEN ABOARD U.S. NAVY SHIPS: LIFE STYLE BEHAVIORS AND HEALTH PROMOTION ISSUES

LEAD AUTHORS: Terry L. Conway, Ph.D., and Frank C. Garland, Ph.D.

ABSTRACT

The Department of Defense has advanced vigorous health promotion efforts emphasizing healthful life styles and reduction of health risks as a way to enhance military readiness and the quality of life of military personnel. This report presents findings from a comprehensive epidemiological study of women aboard Navy ships conducted at the Naval Health Research Center in San Diego, California. Information is provided on life style behaviors and perceived access to health promotion services. Comparisons are also made between shipboard women and their male shipmates. Age, education, race/ethnicity, marital status, and officer-enlisted status were significantly associated with most life style variables. A majority of shipboard women agreed that most health promotion services were readily available to them, with birth control services perceived as most available and counseling on weight control and stress management as least available. Significant gender differences were found for the majority of variables examined. The current study of shipboard personnel provides a unique opportunity to extend previous research and provide current information related to beneficial and detrimental health behavior among Navy shipboard women.

BACKGROUND

Health promotion has been an important priority area for the U.S. military since the early 1980's. The Department of Defense (DoD) specifically identified health promotion efforts as a way to enhance military readiness and the quality of life of DoD personnel [1]. Within the Department of the Navy (DoN), vigorous health promotion efforts have emphasized the need for healthful life styles and reduction of health risk factors. These efforts began in the early 1980's when the Office of the Chief of Naval Operations promulgated OPNAVINST 6110.1B (and subsequently OPNAVINST 6110.1C and .1D) creating the Navy's Health and Physical Readiness (HAPR) Program [2-4]. This program established minimum standards for physical fitness and weight control and emphasized the need for all Navy personnel to participate in life style behaviors which promote good health. Several areas related to primary health promotion efforts defined as concerns by the Navy [5,6] are examined in this study of shipboard women, and include: (a) tobacco use prevention and cessation, (b) physical activity and fitness, (c) weight control, (d) stress management, and (e) alcohol and drug abuse prevention.

Paralleling the prevention focus for the nation's health in *Healthy People 2000* [7], the U.S. military has recognized the importance of primary prevention. By promoting healthful life style behaviors, substantial reductions in morbidity and mortality associated with preventable illnesses and injuries can be achieved, along with enhancements in quality of life and reductions

in job-related productivity losses. The U.S. military's strong emphasis on achievement and maintenance of high levels of physical fitness is a good example of promoting healthful life style behaviors (i.e., fitness-enhancing activities) that can have a positive impact on job performance, including physical fitness performance [8], perceived quality of life [9-11], and long-term health [7]. The military also has recognized and taken strong action to deal with unhealthful, high-risk behaviors such as use of illegal drugs, alcohol abuse, and high rates of tobacco use [6,12].

Substantial progress has been made in control of use of illegal drugs, and alcohol and tobacco use declined over the decade of the 1980's [13] and into the 1990's [14]. However, military personnel are still more likely than their civilian counterparts to engage in life style behaviors that place them at higher risk for health problems, as well as injuries--namely, higher alcohol and tobacco use [15]. Military women and men have higher rates of use of tobacco and alochol than their civilian counterparts. Furthermore, in Navy personnel these highrisk behaviors may be more prevalent among those assigned to ships than to other duty stations: personnel stationed aboard ships tended to engage in poorer health behaviors than shore-based personnel. This study assesses gender-related differences among shipboard personnel while accounting for potential covariates (such as age, education).

Purpose

The primary purpose of this report is to provide descriptive life style/health promotion information on Navy women assigned shipboard duty. To provide additional perspective, shipboard women will be compared with male shipmates matched on key factors. Specific objectives include the following:

(a) Provide descriptive statistics by demographic categories indicating prevalence of both health-promoting and health-detrimental life style behaviors (e.g., cigarette smoking, alcohol use, physical activity/exercise, weight gain/loss, secondary exposure to tobacco smoke, hours of sleep per day).

(b) Provide descriptive statistics indicating shipboard women's perceived accessibility of *Navy health-promotion services* (e.g, availability of space and time for exercise, birth control/family planning services, counseling for drug and alcohol abuse, smoking cessation, stress management, weight control, other medical concerns).

(c) Examine gender differences among shipboard personnel in prevalence of life style behaviors and perceived access to health-promotion counseling services.

METHODS

This study is part of the "Women Aboard Navy Ships Comprehensive Health and Readiness Research Project" conducted at the Naval Health Research Center in San Diego,

California as part of the Defense Women's Health Research Program administered by the U.S. Army Medical Research and Materiel Command, Ft. Detrick, Maryland. This epidemiologic research project utilizes several data-collection methods including surveys administered aboard ship. The study is a multi-year effort with all women serving aboard ship eligible for inclusion, along with an equal number of men matched on important characteristics. This is a report of Year 1 survey results, based on 9 months of data collection.

Population

All women serving aboard U.S. Navy ships were eligible for inclusion in the survey portion of the study during Year 1. An equal number of men serving aboard ships who were matched on relevant characteristics also were eligible. The Navy Bureau of Personnel (PERS-OOW) provided a listing of all ships with women assigned aboard; this listing was verified with respective Fleet Surgeons and Force Medical Officers. A total of 74 ships with 7,944 women and 69,012 men assigned were eligible for inclusion in the study.

This report is based on the first 22 ships surveyed. These ships were surveyed based on availability as determined by the commanding officer and medical department of each ship. The ships surveyed included the USS BARRY, CAMDEN, CAPE COD, COMSTOCK, CORONADO, CURTIS WILBUR, DIXON, EMORY S. LAND, GRAPPLE, GRASP, HOLLAND, KISKA, L.Y. SPEAR, MONONGAHELA, MOUNT BAKER, MOUNT HOOD, PLATTE, RAINIER, SANTA BARBARA, SHENANDOAH, SUPPLY, and YELLOWSTONE. These 22 ships had 3,813 women and 11,985 men assigned aboard. The period of data collecton was 15 November 1994 through 30 October 1995.

Gender Matching

The men aboard ship included in this study were matched to women on the following characteristics: ship, work division, department, race (white, black, Hispanic, or other), pay grade (E1-E3, E4-E6, E7-E9, O1-O3, O4-O6), rating (if no individual was available in the same rating, an individual with a closely related rating was selected), and date of birth (nearest date of birth, not to exceed plus or minus two years). The N=4 warrant officers in the sample were included with the E7-E9 pay grade category. In the infrequent instances where these criteria could not be met, men that matched as closely as possible to women were selected.

The procedure for selection of the matched men in the study was accomplished as follows: (1) the population assigned to all ships was determined using NHRC files, and an electronic roster was developed which included all data elements needed for matching; (2) the personnel department of each ship provided an electronic roster which was compared to the NHRC roster, and a final roster was determined; (3) a computerized matching algorithm was applied to select the men to be included in the survey; and (4) individual identification labels were created and affixed to survey packets.

Survey Development

Several methods were used for the development of the U.S. Navy Shipboard Health Survey used in this study, including the following: (1) review of extant questionnaires, relevant scientific literature, and standard scales, (2) convening of a panel of subject-matter experts, (3) determination of major issues from knowledgeable sources, and (4) review of Navy requirements concerning the reporting of women's health and access to health care.

A series of questionnaires developed by the Centers for Disease Control and Prevention (CDC), Department of Defense, U.S. Navy, U.S. Army, and several universities were reviewed and adopted for use in this study [17-18] . The questionnaires developed by the CDC included the National Health Interview Survey [19], the Health Interview Survey Form HIS-1(1992) and HIS-2 (1992) [20-21], the National Ambulatory Health Care Survey for 1994, 1995, and 1996 [22], and the Youth Behavior Survey [23]. Previous questionnaires developed by the Naval Health Research Center also were used. In addition, a series of scales and inventories were reviewed and selected for use. These standard scales included, but were not limited to, the Center for Epidemiological Studies Depression Scale (CES-D) [24], a scale which measures the current frequency of depressive symptoms, and the Quality of Life Scale [25], a four-item scale previously used in research on Navy populations.

Measures Specific to This Report

Three sets of measures were analyzed for this report: (a) socio-demographic variables, (b) lifestyle behaviors, and (c) perceived availability of health promotion services. The ***socio-demographic*** variables included the following: gender, age, race/ethnicity, highest level of education completed, marital status, paygrade, total number of years on active duty, and location where the person lived when the ship was in port.

Lifestyle Behaviors. Measures related to lifestyle behaviors briefly covered five topics: cigarette smoking, alcohol use, physical activity, weight change, and sleep. Specific items included the following: ever smoked at least 100 cigarettes in entire life, the number of days cigarettes were smoked during the past 30 days, the average number of cigarettes smoked per day during past 30 days, past 30-day exposure to tobacco smoke in immediate work area, past 30-day exposure to tobacco smoke in sleeping or non-work area, number of days during the past seven days that any alcoholic beverages were consumed, usual number of alcoholic drinks consumed per day on the days one drank during the past seven days, the number of days in an average week that exercise/sports were engaged for at least 20 minutes without stopping, the number of days in an average week that the respondent engaged in work for at least 20 minutes without stopping that was hard enough to make breathing heavier and heartbeat faster, gain or loss of weight during the past 30 days, and average number of hours of sleep per 24-hour period during the past 30 days.

From these life style questions, seven measures were constructed that could be used to determine prevalence rates for comparisons across subgroups. ***Current Smoker*** was defined as anyone who both: (a) had smoked at least 100 cigarettes in their entire life, and (b) had smoked on at least one day during the last 30 days. To categorize alcohol use, the total number of alcoholic drinks consumed during the past week was estimated by multiplying the number of days alcohol was consumed during the past week times the usual number of drinks consumed on the days alcohol was consumed during the past week. ***Any Alcohol Past Week*** represents anyone who consumed at least one or more alcoholic drinks during the past week. ***Heavy Alcohol Past Week*** was defined as consuming 15 or more alcoholic drinks during the past week. This number was selected based on current health-based recommendations to consume no more than 1-2 alcoholic drinks per day (i.e., no more than 14 per week). These three lifestyle variables were measured in all versions of the survey and, therefore, were available on the entire sample.

Questions related to physical activity, sleep, and weight gain or loss were included on only one version of the survey and, therefore, were available on one-third of the sample. ***Exercise less than 3 days/wk*** and ***Heavy Work less than 3 days/wk*** were constructed from the questions about exercising and working for at least 20 minutes nonstop per day at levels that raised breathing and heart rates. The sample was dichotomized into those who engaged in such physical activity less than three times versus three or more times per week (based on recommendations to engage in vigorous physical activity at least 3-4 times per week [7]. ***Sleep less than 6 hrs/day*** dichotomized the sample into those who reported that during the past 30 days they got less than six hours of sleep on average versus six or more hours of sleep per day. Lastly, the ***Weight Gain*** and ***Weight Loss*** variables contrasted those who reported either that they gained or lost weight during the past 30 days with those who reported their weight had stayed the same.

Health Promotion Services. The perceived availability of ***health promotion services*** was measured by assessing agreement or disagreement regarding whether various services and counseling opportunities were readily available. Participants rated the ready availability of the following: adequate exercise space, adequate exercise time, birth control supplies (e.g., condoms); and counseling services on alcohol abuse, birth control methods, drug abuse, family planning, medical concerns, quitting smoking, stress management, and weight control. Agreement regarding ready access to these services was rated on a 5-point Likert-type scale with 1=strongly agree, 2=agree, 3=neither agree nor disagree, 4=disagree, and 5=strongly disagree.

Survey Administration

The overall administration plan included the distribution of individually identified packets with all necessary materials to each study subject. Whenever possible, study subjects were brought together in a common location aboard ship, briefed on the study, asked to sign informed consent, and asked to complete the survey while study coordinators were present. When, due to shipboard activity, it was not practical for all study subjects to remain in one area, survey questionnaires were distributed, and the participants were allowed to fill them out in work spaces. The completed survey questionnaires were collected by study staff in sealed envelopes in all settings.

Statistical Analyses

Descriptive information was assessed by frequency counts and percentages or means and standard deviations, depending on the type of variable examined. Two-group comparisons (e.g., comparing women and men) were analyzed with chi-square tests (e.g., for categorical or dichotomous variables) or *t*-tests (e.g., for continuous variables). Data were analyzed using the *SPSS for Windows* Version 6.1 statistical package.

RESULTS

Response Rates

The overall median response rate for the 22 ships was 65%. The median response rate for women was 67%. Participation rates varied by the number of women serving aboard ship. Ships with fewer than 100 women assigned had a median response rate of 75%, compared to 50% aboard ships with more than 100 women assigned.

Life Style Behaviors

The study has a longitudinal design with women and men enrolled in Year 1 of the study being contacted again and re-surveyed on a 12-month cycle in Year 2. All women reporting aboard ship (and matched men) in Year 2 also will be enrolled. The total number of participants was 2,167 women and 2,141 men.

The life style measures were analyzed such that prevalence rates among shipboard women for seven life style variables could be determined across socio-demographic categories. Prevalence rates of smoking status and alcohol use according to socio-demographic categories are shown in Table 1. **Current Smoker** status varied significantly across *all* of the socio-demographic categories. The highest prevalence rate of current smoking was in women 35 years and older (41.2%), with the next highest rate in women aged 18-20 years (34.4%). Prevalence of current smoking was lowest among (18.8%) in those with college degrees, highest in those less than a high school degree or GED (50.8%). Women who were separated, divorced, or widowed (44.2%) had a higher rate of smoking than either never married or married women. Enlisted personnel were more likely to be current smokers than were officers, and the rate was highest among senior enlisted women with half of E7 - E9 ratings being current smokers. Smoking rates were highest among women with 10 or more years of service (40.1%) followed by those with 0-2 years of service (35.2%), which parallels the pattern seen with age. Lastly, current smoker rates were lower among women who lived aboard ship or in Navy housing/BEQ/BOQ than among those who lived elsewhere.

Table 1. Prevalence rate of tobacco and alcohol use, by socio-demographic characteristics, shipboard women. U.S. Navy Women Aboard Ship Study, 15 NOV 1995 - 31 JAN 1996.

CHARACTERISTIC	PREVALENCE RATE IN PERCENT		
	CURRENT SMOKING	ANY ALCOHOL USE IN PAST WEEK	HEAVY ALCOHOL USE IN PAST WEEK
Age in years (n range = 2022-2143)			
18-20	34.4	38.9	6.3
21-25	30.6	50.2	6.9
26-34	33.3	53.3	7.2
35 +	41.2	46.7	3.1
p*	0.02	<0.001	0.16
Education (n range = 2041-2163)			
Less than high school/GED	50.8	51.7	6.9
High school graduate	34.7	45.7	7.3
Technical or trade school	29.6	51.5	10.3
Some college	33.8	50.2	5.8
College degree(s)	18.8	54.9	3.0
p*	<0.001	0.12	0.17
Race/Ethnicity (n range = 2045-2167)			
White	46.3	56.9	7.8
Hispanic	33.6	50.4	7.4
Black	16.7	38.6	4.4
Asian/Pacific Islander	15.7	33.3	0.0
Native American	37.5	44.8	3.4
Other	27.3	40.3	10.5
p*	<0.001	<0.001	0.004
Marital Status (n range = 2041-2163)			
Never married	32.0	49.6	7.4
Married	30.5	44.8	4.9
Separated, divorced, or widowed	44.2	53.9	7.1
p*	<0.001	0.02	0.10

CHARACTERISTIC	PREVALENCE RATE IN PERCENT		
	CURRENT SMOKING	ANY ALCOHOL USE IN PAST WEEK	HEAVY ALCOHOL USE IN PAST WEEK
Pay grade (n range = 2011-2130)			
E1 - E3	35.1	46.8	7.4
E4 - E6	32.9	48.2	6.2
E7 - E9, W1-W4	50.5	54.7	4.7
O1-O2	17.0	58.5	5.7
O3-O5	7.3	68.3	2.4
p*	<0.001	0.03	0.60
Years of Active Duty Service (n range = 1990-2108)			
0-2	35.2	47.7	7.9
3-4	30.9	49.9	6.0
5-9	28.0	47.7	6.2
10+	40.1	49.1	5.0
p*	<0.001	0.87	0.31
Location where lived in Home Port (n range = 2037-2157			
Aboard Ship	27.3	46.8	6.5
Navy Housing/BEQ/BOQ	28.4	50.8	5.5
Other	37.4	49.1	6.5
p*	<0.001	0.52	0.87

*p-values were based on the chi-square test.

Any Alcohol Past Week was significantly associated with four socio-demographic variables: age, race/ethnicity, marital status, and paygrade. Women 18-20 years old (38.9%) were least likely to consume any alcohol, whereas, women in the 26-34 year-old category (53.3%) were the most likely to have consumed alcohol during the prior week. White women were the most likely of the race/ethnic groups to have drunk any alcohol (56.9%). Considering marital status, separated/divorced/widowed women (53.9%) were more likely to have drunk any alcohol

during the past week than never married or married women. Officers were more likely than enlisted women to have consumed at least some alcohol during the past week. Only one socio-demographic factor was associated with **Heavy Alcohol Past Week**: race/ethnicity. Those who marked "other" or did not mark a race/ethnic category had the highest rate of heavy alcohol use (10.5%) followed by white (7.8%) and Hispanic (7.4) women.

Table 2 provides prevalence rates for physical activity, sleep, and weight gain/loss by socio-demographic categories. **Exercise less than 3 days/wk** was significantly associated with three socio-demographic categories: age, education, and paygrade. Younger women were less likely to exercise regularly than were older women; over three-quarters of women 35 years or older exercised three or more days per week. High school graduates were the least likely to exercise regularly with 41% exercising less than three days a week. Enlisted women also were less likely to exercise regularly than were officers. **Heavy Work less than 3 days/wk** was associated with the same three socio-demographic categories (although only a borderline trend [$p < .10$] with age), but in the opposite direction. That is, older individuals, those with college degrees, and officers were less likely to engage in heavy work regularly than younger, less educated, and enlisted women.

Sleep less than 6 hrs/day was significantly associated with three socio-demographic variables: marital status, paygrade [trend, $p < .10$), and years of active duty service. Separated, divorced, or widowed women (53.5%) were more likely to sleep less than six hours per day than were never married or married women. Over half of women with two or fewer years of naval service got less than six hours of sleep per day, whereas, just over a third of women with more than two years of service slept this little. Consistent with this finding was the trend for more junior personnel, both enlisted E1-E3 (47.5%) and officers O1-O2 (52.6%), to sleep less than 6 hours per day.

Weight Gain was associated with both race/ethnic group and paygrade. White women (20.8%) were the least likely of the race/ethnic groups to report any weight gain over the past month. Considering paygrade, lower paygrade women were most likely to report some weight gain with 37.1% of E1-E3 women reporting weight gain over the past 30 days. **Weight Loss** also was associated with race/ethnic group with Black women (42.1%) most likely to report weight loss in the past 30 days. Lastly, years of active duty service were significantly associated with reported weight loss with 40.0% of those with 5-9 years of service reporting losing weight in contrast to only 22.2% of those with 10 or more years of service reporting weight loss during the past 30 days.

Table 2. Prevalence rate of Physical Activity, Sleep, and Weight Change by Socio-Demographic Categories Among Shipboard Women, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

SOCIO-DEMOGRAPHIC CHARACTERISTIC	PERCENT				
	EXERCISE LESS THAN 3 DAYS/WK	HEAVY WORK LESS THAN 3 DAYS/WK	SLEEP LESS THAN 6 HRS/DAY	WEIGHT GAIN*	WEIGHT LOSS+
Age in years (n range = 604-624)					
18-20	38.1	52.4	44.8	30.2	33.0
21-25	39.4	54.3	42.4	29.1	32.7
26-34	29.6	61.9	41.6	28.1	34.6
35 +	22.9	67.1	35.3	27.1	20.4
p*	0.02	0.09	0.64	0.98	0.28
Education (n range =607-627)					
Less than high school/GED	20.0	35.0	40.0	18.8	23.5
High school graduate	41.0	57.7	38.5	27.3	31.7
Technical or trade school	18.2	40.9	45.5	41.2	33.3
Some college	31.9	53.6	46.3	33.5	34.3
College degree(s)	19.1	89.4	42.2	16.7	26.8
p*	0.003	<0.001	0.51	0.15	0.83
Race/Ethnicity (n range =610-630)					
White	34.8	57.4	45.2	20.8	27.2
Hispanic	32.4	59.5	41.7	31.0	25.9
Black	34.4	57.2	34.5	38.9	42.1
Asian/Pacific Islander	43.5	56.5	43.5	30.0	17.6
Native American	18.2	54.5	54.5	44.4	28.6
Other	35.1	59.5	52.9	39.3	34.6
p*	0.82	0.99	0.14	0.004	0.03

SOCIO-DEMOGRAPHIC CHARACTERISTIC	PERCENT				
	EXERCISE LESS THAN 3 DAYS/WK	HEAVY WORK LESS THAN 3 DAYS/WK	SLEEP LESS THAN 6 HRS/DAY	WEIGHT GAIN*	WEIGHT LOSS+
Marital Status (n range = 610-630)					
Never Married	38.2	57.9	40.1	28.6	31.9
Married	31.7	57.6	39.0	31.2	31.6
Separated/divorced/widowed	30.4	55.9	53.5	24.7	32.1
p*	0.189	0.935	0.036	0.584	0.996
Pay grade (n range = 602-622)					
E1 - E3	40.6	54.0	47.5	37.1	32.7
E4 - E6	31.4	55.7	38.6	25.8	33.7
E7 - E9, W1-W4	38.7	67.7	33.3	21.4	12.0
O1-O2	19.0	85.7	52.6	12.5	26.3
O3-O5??	12.5	100.0	12.5	0.0	12.5
p*	0.052	0.004	0.062	0.015	0.154
Years of Active Duty Service (n range =595-615)					
0-2	36.7	50.6	52.6	36.0	31.0
3-4	38.7	59.8	36.7	24.6	33.6
5-9	32.7	58.9	39.9	30.3	40.0
10+	28.0	64.0	37.0	24.5	22.2
p*	0.243	0.106	0.010	0.142	0.047
Location where Lived in Home Port (n range =607-627)					
Aboard ship	36.8	57.8	41.8	30.8	35.3
Navy housing/BEQ/BOQ	27.3	56.1	46.9	34.8	37.5
Other	34.7	57.5	41.2	27.2	29.0
p*	0.367	0.970	0.699	0.490	0.270

*The sample size was somewhat reduced because only the "gained weight" versus "stayed the same" groups were compared (i.e., "lost weight" group was dropped). N ranged from 458-470.
+The overall n size was somewhat reduced because only "lost weight" versus "stayed the same" groups were compared (i.e., "gained weight" group was dropped). N ranged from 477-490.

Health Promotion/Counseling Services. Birth control supplies and counseling on birth control methods were seen as among the most readily available services (Table 3). Quitting smoking, stress management, and weight control counseling were rated as the least readily accessible. Only these latter three health promotion services were rated by *less* than 50% of the sample as readily accessible.

Table 3. Perceived Accessibility of Navy Health-Promotion and Counseling Services, Shipboard Men, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

READY AVAILABILITY OF ...	(1) STRONGLY AGREE	(2) AGREE	(3) NEITHER AGREE NOR DISAGREE	(4) DISAGREE	(5) STRONGLY DISAGREE	MEAN	SD	N
Birth Control Supplies	31.0	41.5	15.8	4.6	7.2	2.15	1.13	545
Space for Exercise	23.5	45.4	17.1	8.7	5.3	2.27	1.08	608
Time for Exercise	18.4	40.5	15.5	12.9	12.7	2.61	1.28	613
Counseling Services for..								
Birth Control Methods	22.3	39.3	23.9	5.0	9.5	2.40	1.17	524
Alcohol Abuse	19.6	36.4	27.8	5.6	10.6	2.51	1.18	500
Drug Abuse	18.3	37.6	27.6	6.2	10.3	2.52	1.17	497
Medical Concerns	14.6	39.5	25.8	10.0	10.1	2.62	1.16	542
Family Planning	14.6	35.4	30.6	8.7	10.7	2.65	1.16	506
Quitting Smoking	14.7	32.9	33.3	8.2	10.8	2.68	1.15	498
Stress Management	12.6	33.6	28.3	12.1	13.4	2.80	1.21	530
Weight Control	12.6	33.0	28.4	13.4	12.6	2.80	1.20	522

Gender Differences

Life Style Measures. Differences between women and men in prevalence rates of life style behaviors and perceived accessibility to health-promotion services were conducted. Significant ($p < .05$) gender differences in the rates were found for 9 of 12 variables examined, and two additional smoking-related variables showed trends ($p < .10$) for gender differences (Table 4).

Table 4. Prevalence Rates of Selected Health Behaviors for Shipboard Women and Men, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

BEHAVIOR	PERCENT		P^+
	WOMEN	MEN	
Tobacco			
More than 100 cigarettes in life (women n=2138; men n=2084)			<0.001
Yes	42.7	49.5	
Current Smoker (women n=2167; men n=2141)			0.096
Yes	33.4	35.8	
(Smokers Only) Average # Cigarettes Smoked per Day (women n=711; men n=749)			0.063
less than 1-9	36.6	40.9	
10-19	36.6	30.6	
20 -39	20.5	20.4	
40 or more	6.3	8.1	
Exposure to cigarette smoke for more than 1 hour per day in **work** area (women n=2119; men n=2063)			<0.001
Yes	17.0	21.4	
Exposure to cigarette smoke for more than 1 hour per day in **sleep/non-work** area (women n=2124; men n=2069)			0.004
Yes	20.7	17.3	
Alcohol			
Number of days in past week drank any alcohol (women n=2074; men n=2045)			<0.001
0	52.6	40.3	
1-2	31.6	31.0	
3-4	10.9	17.1	
5 or more	5.0	11.6	
In past week, number of alcoholic drinks (women n=2045; men n=1973)			<0.001
0	51.5	40.0	

BEHAVIOR	PERCENT		P^+
	WOMEN	MEN	
1-4	26.9	22.9	
5-14	15.2	19.6	
15 or more	6.5	17.5	
(Drinkers only) In past week, number of drinks usually had per day (women n=955; men n=1149)			<0.001
1-2	54.3	39.3	
3-4	29.1	28.3	
5 or more	16.5	32.5	
Physical Activity			
Number of days in past week exercised for 20+ min without stopping (women n=630; men n=625)*			<0.001
0	16.5	10.9	
1-2	18.1	19.8	
3	35.7	29.1	
4 or more	29.7	40.2	
Number of days in past week engaged in heavy work for 20+ min (women n=628; men n=625)*			0.002
0	31.5	22.6	
1-2	26.0	26.9	
3	16.1	17.1	
4 or more	26.4	33.4	
Sleep & Weight Change			
Average Hours of Sleep per 24 hours (women n=610; men n=591)*			0.119
less than 4	12.0	12.7	
5	30.0	23.2	
6	31.8	35.4	
7	16.6	17.6	
more than 8	9.7	11.2	

BEHAVIOR	PERCENT		P^+
	WOMEN	MEN	
Weight Change in Past 30 Days (women n=626; men n=625)[+]			<0.001
Gained weight	21.7	14.1	
Lost weight	24.9	17.8	
Stayed the same	53.4	68.2	

[+] Reduced n for this variable because it was given in only one version of the survey.
* Significance of Pearson Chi Square comparing male and female proportions.

Regarding smoking behavior, a higher percentage of men (49.5%) than women (42.7%) had smoked at least 100 cigarettes in their entire life. Also, a slightly higher percentage of men (35.8%) currently smoked than did women (33.4%); however, more men tended to smoke under 10 cigarettes per day, while more women than men smoked 10-19 cigarettes per day. Men were significantly more likely than women to be exposed to cigarette smoke for at least an hour per day in a *work* area, whereas, women were more likely to be exposed to cigarette smoke in sleeping or other non-work areas.

Shipboard women consumed significantly less alcohol than their male shipmates. Over half of the women had not drunk alcohol during the previous seven days, whereas, 60% of the men had drunk alcohol at least once during the past week. During the prior week, women consumed fewer alcoholic drinks overall as well, with only about 22% of women drinking five or more drinks all week compared to 37% of men drinking this quantity. In addition, when drinkers only were examined, women reported typically having fewer drinks per day than did men. Over half (54.3%) of women drinkers usually had only 1-2 drinks per day, whereas, 60% of men drinkers reported usually having 3 or more drinks per day.

Women reported that they engaged in less physical activity during the past week than did men. Only about 30% of the women compared to 40% of the men said they exercised four or more days during the past week. In addition, the majority of women reported engaging in heavy work on two or fewer days, while the majority of men said they engaged in heavy work on three or more days during the past week.

With regard to weight change during the past 30 days, men were most likely to report that their weight had stayed the same (68.2%), whereas, more women were likely to report that they had gained weight (21.7%) or lost weight (24.9%) during the past month. There was no significant difference in the number of hours of sleep women and men said they typically got each day.

Health promotion services. Women perceived less ready access than did men to all health promotion services with the exception of birth control supplies and counseling, both of which showed no significant differences across men and women (Table 5). Also, perceived accessibility to counseling for quitting smoking showed only a borderline difference ($p=.07$) between men and women. Women were less likely than men to agree that space and time for exercise were readily available. Women also indicated lower perceived availability of counseling services on alcohol and drug abuse, general medical concerns, family planning, quitting smoking, stress management, and weight control than did men.

Table 5. Comparison of Shipboard Women and Men on Perceived Accessibility to Navy Health-Promotion and Counseling Services, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

	WOMEN			MEN			t-VALUE	SIGNIF. LEVEL
	MEAN*	SD	*N*	MEAN*	SD	*N*		
Birth Control Supplies	2.15	1.13	545	2.27	1.16	494	1.62	0.106
Space for Exercise	2.27	1.08	608	2.05	1.02	600	3.67	<0.001
Time for Exercise	2.61	1.28	613	2.37	1.24	601	3.26	0.001
Counseling Services for..								
Birth Control Methods	2.40	1.17	524	2.38	1.06	481	0.35	0.729
Alcohol Abuse	2.51	1.18	500	2.28	1.03	509	3.26	0.001
Drug Abuse	2.52	1.17	497	2.32	1.04	505	2.96	0.003
Medical Concerns	2.62	1.16	542	2.34	1.00	534	4.24	<0.001
Family Planning	2.65	1.16	506	2.47	1.06	515	2.71	0.007
Quitting Smoking	2.68	1.15	498	2.54	1.11	492	1.84	0.067
Stress Management	2.80	1.21	530	2.53	1.12	524	3.70	<0.001
Weight Control	2.80	1.20	522	2.53	1.12	507	3.78	<0.001

* Mean of responses based on a 5-point Likert-type scale, where 1="strongly agree," 2="agree," 3="neither agree nor disagree," 4="disagree," and 5="strongly disagree."

DISCUSSION

This report provides descriptive information on life style behaviors and perceptions about health promotion services for a sample of Navy women and a comparison group of men stationed aboard ships. Perceived accessibility of Navy health-promotion services was ascertained using ratings of the availability of space and time for exercise, birth control/family planning services, counseling for drug and alcohol abuse, smoking cessation, stress management, weight control, and counseling for other medical concerns. Gender differences among shipboard personnel in life style behaviors and perceived accessibility to health-promotion counseling services were examined.

Life Style Behaviors

Several socio-demographic characteristics were significantly associated with the life style variables. Being a current smoker, for example, was significantly related to all seven socio-demographic variables examined. Among shipboard women current smokers were most likely to be 35 years or older (although 18-20-year-old women had the next highest rate of smoking), have a lower education level; be non-Hispanic caucasian, separated/divorced/widowed, and enlisted rather than officers; and to have either 10 or more years of service or two or fewer years of service, and *not* live onboard ship or in Navy-sponsored housing.

The association between smoking and education, which also is reflected in the association with officer-enlisted status, is consistent with findings in civilian samples in which those with a high school education or less smoke at higher rates than college graduates [26]. Although the smoking rate among Navy shipboard women (34.4%) is much higher than the rate for civilian women (22.8% in 1990) [27], similar to the civilian population white women are more likely to be current smokers than black or Hispanic women. In the civilian population, however, black women have a higher smoking rate that Hispanic women [27]; in this shipboard sample, Hispanic women had a higher smoking rate than did black women. Formerly married (i.e., separated, divorced, or widowed) civilian women aged 18-44 years were more likely to be smokers (39.4%) than either never married or married women (23.9%) [27]. The pattern was similiar in Navy shipboard women.

Use of any alcohol in the week prior to the survey was associated with age, race/ethnicity, marital status. White women, ages 26-34 years, separated/divorced/widowed women, and officers were more likely to have had at least some alcohol during the past week than their counterparts. The only socio-demographic variable associated with heavy alcohol use during the past week was race/ethnic group, with those who did not mark a specific group identity were most likely to have engaged in heavy alcohol use during the past week, followed by white and Hispanic women. However, Navy shipboard women (6.5%) were much more likely overall to engage in "heavy drinking" (i.e., over two alcoholic drinks per day) during the prior week than were civilian women (under 2%) [27].

Age, education, and pay grade also were associated with the amount of physical activity of shipboard women. Older women and officers (who are also most likely to be college graduates) were more likely than their counterparts to engage in vigorous physical exercise three or more days per week; conversely, they were less likely to engage in work that involved heavy physical activity. The associations between physical activity and education among shipboard women are consistent with those found in civilians (i.e., higher education associated with more regular exercise or sports play and lower education associated with more physically demanding jobs) [27]. Overall, however, Navy shipboard women exercised more regularly than did civilian women. Over 65% of shipboard women reported exercising three or more days during the previous week, whereas, only about 42% of civilian women aged 18-44 years said that they exercised or played sports "regularly" [27]. Furthermore, under 7% of civilian women specified that "exercise needs to be performed three times per week and maintained 20 minutes per session to strengthen the heart and lungs" [27], which is what two-thirds of Navy women reported *actually* doing during the previous week.

Almost three-quarters of Navy shipboard women reported averaging six or fewer hours of sleep per day. Junior personnel, both enlisted and officers, tended to get less sleep than those who had been in the Navy longer. Also, separated/divorced/widowed women slept fewers hours per day than did never married or married women. Considering weight changes during the prior month, over half of shipboard women reported that their weight stayed the same while the other half was split with just under a quarter reporting weight gain and the other quarter reporting weight loss.

Accessibility to Health Promotion Services

A majority of shipboard women agreed that most health promotion services were readily available to them. Almost three-quarters of the women agreed that birth control supplies were readily available, and just under two-thirds agreed that they had ready access to counseling on birth control methods. Most women also agreed that space for exercising was readily available, although a quarter of the women disagreed with a statement that there was sufficient time available for exercising.

Just over half of the women agreed that counseling on alcohol abuse, drug abuse, medical concerns, and family planning was readily available. There was most disagreement on availability of counseling on weight control and stress management (over a quarter of the women disagreed that services were readily available) and counseling on quitting smoking (almost a fifth of the sample disagreed that services were readily available).

Gender Differences

Despite the fact that the shipboard men in this sample had been matched on key characteristics such as age, race/ethnic group, rating, and work department aboard ship,

significant gender differences were found for most of the variables examined. Fewer women than men smoked cigarettes, although more men were among the lightest smokers (i.e., smoking under 10 cigarettes per day). Women also consumed less alcohol than did men. Women both drank on fewer days of the week and had fewer drinks on those days than did men. Considering second-hand exposure to cigarette smoke, men were more likely than women to be exposed to cigarette smoke for at least an hour per day in a *work* area; however, women were more likely to be exposed to cigarette smoke in *sleeping* or other *non-work* areas.

Shipboard women engaged in somewhat less healthful behavior than men when considering physical activity and weight change. Women reported getting less physical activity during the prior week than did men. Only about 30% of women compared to 40% of men said they exercised four or more days during the past week. In addition, men were more likely than women to engage in heavy work activity. Men also reported more stability in their weight during the prior month. Over two-thirds of men reported that their weight had stayed the same, whereas, over a fifth of women reported that they had gained weight and another quarter reported that they had lost weight during the past month. There was no significant difference in the number of hours of sleep women and men said they typically got each day.

Gender differences also were evident in ratings of accessibility to health promotion services. Women were less likely than men to agree that space and time for exercise were readily available. Counseling services on alcohol and drug abuse, general medical concerns, family planning, quitting smoking, stress management, and weight control also were rated as less readily available by women than by men. Agreement between women and men was found, however, on the perceived accessibility of birth control supplies and counseling, both of which showed no significant differences between men and women. Also, perceived accessibility to counseling for quitting smoking showed only a marginally significant difference between men and women.

In summary, this report presents findings describing life style behaviors and perceptions about access to health promotion services among Navy women assigned shipboard duty. Differences associated with socio-demographic factors as well as gender are presented. Further explorations of these data should include comparisons of shipboard women to women assigned to shore-based duty stations. Additional analyses also should be conducted to examine the independent predictors of life style behaviors, taking into account the socio-demographic correlates of these behaviors identified here. This comprehensive epidemiological provides a unique opportunity to extend previous research and to provide current information on health-promoting and health-detrimental life style behaviors of Navy shipboard women.

Notes:

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APPENDIX G.13

Epidemiology of Sick Call Visits Aboard U.S. Navy Ships

Cedric F. Garland, Ph.D.

REPORT TOPIC AREA: THE EPIDEMIOLOGY OF SICK CALL VISITS ABOARD U.S. NAVY SHIPS

LEAD AUTHOR: Cedric F. Garland, Ph.D.

ABSTRACT

This study is an analysis of sick call visit aboard 23 Navy ships. Data on medical encounters were obtained by electronic data transfer of automated sick call logs aboard 12 ships and by key-entering special research sick call logs maintained aboard 11 ships for defined time intervals during 1994-1995. The design was similar to that used in a previous study conducted at the Naval Health Research Center (Nice DS, Hilton SM. Sex differences in health care requirements aboard U.S. Navy ships. Naval Health Research Center Technical Report No. 90-2, San Diego CA: NHRC, 1990). All diagnoses were coded using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). Diagnoses are reported here by gender for broad diagnostic categories. Rosters of all personnel aboard the ships were obtained for denominator data, allowing calculation of monthly sick call visit rates per 1,000 crew members according to diagnosis and gender. The principal reasons for sick call visits in women (with visit rates per 1,000 person-months in parentheses) were health services (79.1), injuries (63.5), diseases of the respiratory system (59.5), infectious and parasitic diseases (36.8) and genitourinary disorders (29.2). Health services included general medical examinations, visits for contraceptive management, Papanicolaou smears, and visits associated with pregnancy testing and normal pregnancies. The principal reasons for sick call visits in men were injuries (56.1), diseases of the respiratory system (38.9), health services (26.6), diseases of the skin (21.7) and infectious and parasitic diseases (21.0). There were substantial differences in sick call visit rates between women and men, with an overall ratio of 1.8 visits by women for each visit by men, identical to the ratio previously reported by Nice and Hilton.

INTRODUCTION

Nice and Hilton of the Naval Health Research Center (NHRC), San Diego CA, analyzed individual sick call visits in men and women aboard 15 ships during November 1988 (N = 4,843 visits), and 20 ships during June 1989 (N = 7,699 visits) [1, 2]. Methods for calculating, reporting, and forecasting illness rates in the Navy [3] and for assessing illness rates aboard Navy ships have been described by Pugh, Gunderson, and colleagues, also of NHRC [4-6].

The study conducted by Nice and Hilton included ascertainment of individual sick call visits aboard several types of ships, including destroyer tenders (AD), repair ships (AR), salvage ships (ARS), submarine tenders (AS), and oilers (AO). That study examined many factors related to sick call visit rates, including type of ship, gender, and occupational rating. The mean sick call visit rate in women was 1.8 times that in men. The sick call visit rate for women was 788 visits per 1,000 crew per month, and the mean rate for men was 440 per 1,000 crew per

month. The overall mean visit rate was 525 per 1,000 crew per month. The most frequent diagnostic categories accounting for sick call visits were the same in both genders—injuries, infectious and parasitic diseases, and respiratory system disorders (Table 1). The principal diagnoses for female-specific disorders (or disorders predominantly occurring in women) were urinary-tract infections, vaginal candidiasis, and pain and other symptoms associated with female genital organs, including premenstrual syndrome (Table 2).

More recently, sick call visit rates in men aboard a U.S. Navy aircraft carrier were studied as part of an investigation of shipboard dermatological and venereal diseases by Vidmar et al., during an approximately three-month study in 1994 [7]. The sick call visit rate for all diagnoses was 234 per 1,000 crew per month. The carrier did not have women crew members aboard at the time of the study. The ten most common diagnoses in this study are listed in Table 1.

Table 1. Diagnostic categories with highest monthly sick call visit rates per 1,000 crew, by gender, 35 U.S. Navy ships in the Nice and Hilton study, November 1988 and June 1989 [1,2], and one aircraft carrier in the Vidmar et al., Study, January - April 1994 [7].

WOMEN (NICE and HILTON, 1988-1989)		**MEN (NICE and HILTON, 1988-1989)**		**MEN (VIDMAR et al., 1994) (Five categories reported)**	
DISORDER	**MONTHLY RATE PER 1,000 CREW**	**DISORDER**	**MONTHLY RATE PER 1,000 CREW**	**DISORDER**	**MONTHLY RATE PER 1,000 CREW**
Injuries	115.1	Injuries	98.5	Skin diseases	94.0
Infectious or parasitic	83.6	Infectious or parasitic	50.7	Respiratory	46.3
Respiratory	72.5	Respiratory	42.1	Digestive system	41.3
Genitourinary	65.2	Musculoskeletal	35.2	Injuries	22.2
Musculoskeletal	48.4	Skin diseases	35.0	Musculoskeletal	19.9
Ill-defined	46.6	Nervous system	18.1		
Nervous system	37.7	Ill-defined	16.9		
Digestive System	28.1	Digestive system	14.7		
Mental disorders	11.8	Endocrine disorders	7.2		
Endocrine disorders	8.4	Mental disorders	6.7		
TOTAL	517.4		325.1		223.8

Table 2. Monthly sick call visit rates PER 1,000 crew for female-specific disorders and disorders predominantly occurring in women, 35 U.S. Navy ships in the Nice and Hilton study, November 1988 and June 1989 [1,2].

DIAGNOSIS	MONTHLY RATE PER 1,000 WOMEN
Urinary tract infection	20.81
Candidiasis	14.60
Pain/symptoms associated with female genital organs (premenstrual syndrome/cramps)	13.99
Other disease due to viruses/chlamidiae	8.53
Vaginitis	8.36
Other disorders of female genital organs (vaginal rash or discharge)	7.16
Menstrual disorders	5.29
Other venereal disease (sexually transmitted disease/non-gonococcal urethritis/NSU)	2.90
Spontaneous abortion	1.71
Symptom of digestive system, pregnancy-related (morning sickness)	1.54
TOTAL	84.89

METHODS

This study is an analysis of sick call visits aboard 23 Navy ships, including two destroyers, one guided missile destroyer, four ammunition ships, four fast combat support ships, three salvage ships, two submarine tenders, three oilers, and four dock landing ships (Table 3). These 23 ships are a subset of a larger number of ships that provided data on sick call visits (Appendix Table A-1). Data on shipboard medical department encounters were obtained by electronic data transfer of automated sick call logs aboard 13 ships and by key-entering complete sick call logs aboard 11 ships for defined time intervals during 1994-1995. The design was similar to that used in a previous study conducted by Nice and Hilton at the Naval Health Research Center [1, 2]. Diagnoses were selected by shipboard medical officers and hospital corpsmen from on-screen diagnostic menus that automatically assigned diagnostic codes from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) [8] to each diagnosis for ships using the Shipboard Automated Medical System (SAMS). For ships using Naval Health Research

Center sick call logs, diagnoses were coded by NHRC staff using ICD-9-CM. Health services provided at sick call without a diagnosis of disease or injury, such as general medical examinations, routine visits for contraceptive management, routine Papanicolaou smears, and visits associated with pregnancy testing or normal pregnancies were coded according to the ICD-9-CM supplementary classification of factors influencing health status and contact with health services (Codes V01-V82)[8]. Rosters listing all crew aboard were obtained from the personnel division aboard each ship.

Person-months at risk aboard each ship were calculated by multiplying the number of crew members of each gender by the number of days that sick call visits were ascertained. The number of person-days was divided by 30 to obtain the number of person months at risk. The period of ascertainment was defined as the number of days between the first recorded day of sick call visits and the last recorded day of sick call visits, at any time during the period from 1 January 1994 to 31 December 1995.

RESULTS

There were 5,968 sick call visits by women during 14,416 woman-months, and 15,914 visits by men during 70,553 man-months aboard the 23 ships (Table 3). The principal reasons for sick call visits in women were health services, injuries, diseases of the respiratory system, and infectious and parasitic diseases (Table 4 and Figure 1). The principal reasons for sick call visits in men were injuries, diseases of the respiratory system, health services, diseases of the skin, and infectious and parasitic diseases. There were substantial differences in sick call visit rates between women and men, with an overall ratio of 1.8 visits by women for each visit by men. Diagnostic categories of sick call visits are displayed in order of gender ratio in Figure 2. The highest gender ratios were for diseases of the genitourinary system, blood and blood-forming organs (including anemias), and endocrine and metabolic disorders (including obesity).

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Table 3. Summary of ships in the sick call visit rate study, according to number of medical encounters, women and men assigned aboard, person-months at risk, and type of medical records maintained aboard, 23 U.S. Navy ships, 1994-1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

		CREW				NUMBER OF SICK CALL VISITS				
		WOMEN		MEN						
SHIP NAME	Hull Number	No.	Woman-months	No.	Man-months	Women	Men	Beginning date	Ending date	Type of record
USS ASHLAND	LSD-48	32	108	362	1,219	87	315	7/1/95	10/10/95	Log
USS JOHN BARRY	DDG-52	19	130	319	2,190	14	261	1/3/95	7/28/95	SAMS
USS CAMDEN	AOE-2	69	1,389	576	11,597	212	2599	1/1/94	8/28/95	Log
USS COMSTOCK	LSD-45	37	659	298	5,304	141	1054	1/1/94	6/19/95	SAMS
USS DETROIT	AOE-4	63	233	548	2,028	132	512	6/1/95	9/20/95	Log
USS EMORY S. LAND	AS-39	457	4,143	1,069	9,692	2,070	2683	1/1/95	9/30/95	SAMS
USS GRASP	ARS-51	27	81	87	261	24	81	6/1/95	8/30/95	Log
USS HAYLER	DD-997	36	365	307	3,111	33	229	12/24/94	10/24/95	SAMS
USS JOHN YOUNG	DD-973	24	22	306	286	8	64	4/1/95	4/29/95	SAMS
USS KISKA	AE-35	75	230	321	984	246	457	6/8/95	9/8/95	Log
USS MAUNA KEA	AE-22	27	266	287	2,822	18	234	1/4/95	10/26/95	Log
USS MERRIMACK	AO-179	90	333	220	814	204	299	6/1/95	9/20/95	Log
USS MONONGAHELA	AO-178	97	582	195	1,170	420	471	1/1/95	6/30/95	SAMS
USS MOUNT HOOD	AE-29	96	790	329	2,709	289	578	1/2/95	9/6/95	Log
USS PLATTE	AO-186	85	893	183	1,922	465	697	1/1/95	11/12/95	SAMS
USS RAINIER	AOE-7	74	168	507	1,149	98	370	66/1/95	8/8/95	Log

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		CREW				NUMBER OF SICK CALL VISITS				
		WOMEN		MEN						
SHIP NAME	Hull Number	No.	Woman-months	No.	Man-months	Women	Men	Beginning date	Ending date	Type of record
USS RUSHMORE	LSD-47	1	12	342	4,218	5	1,264	1/1/95	1/6/95	SAMS
USS SACRAMENTO	AOE-1	68	1,607	549	12,975	601	2,474	1/1/94	12/11/95	SAMS
USS SAFEGUARD	ARS-50	25	103	78	322	22	18	1/5/95	5/9/95	SAMS
USS SALVOR	ARS-52	23	103	81	362	50	81	1/3/95	5/17/95	SAMS
USS SANTA BARBARA	AE-28	87	606	290	2,020	148	305	1/3/95	7/31/95	SAMS
USS SIMON LAKE	AS-33	338	1,341	793	3,146	659	624	6/2/95	9/29/95	Log
USS TORTUGA	LSD-46	26	252	26	252	22	244	1/1/95	10/19/95	Log
TOTAL		1,876	14,416	8,073	70,553	5,968	15,914			

Table 4. Monthly sick call visit rates per 1,000 crew, by major diagnostic category and gender, 23 U.S. Navy Ships, 1994-1995, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

		WOMEN (N=14,416 PERSON-MONTHS)		MEN (N=70,553 PERSON-MONTHS)		
	ICD-9-CM CODE RANGE	NO. OF VISITS	RATE PER 1,000 PERSON-MONTHS	NO. OF VISITS	RATE PER 1,000 PERSON-MONTHS	RATIO OF RATE IN WOMEN TO RATE IN MEN
Infectious and parasitic diseases	001-139	530	36.8	1,483	21.0	1.7
Neoplasms	140-239	9	0.6	39	0.6	1.1
Endocrine and metabolic disorders	240-279	203	14.1	179	2.5	5.6
Diseases of the blood and blood-forming organs	280-289	9	0.6	6	0.1	7.3
Mental disorders	290-319	117	8.1	245	3.5	2.3

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		WOMEN (N=14,416 PERSON-MONTHS)		MEN (N=70,553 PERSON-MONTHS)		
	ICD-9-CM CODE RANGE	NO. OF VISITS	RATE PER 1,000 PERSON-MONTHS	NO. OF VISITS	RATE PER 1,000 PERSON-MONTHS	RATIO OF RATE IN WOMEN TO RATE IN MEN
Diseases of the genitourinary system	580-629	421	29.2	222	3.1	9.3
Diseases of skin and subcutaneous tissue	680-709	254	17.6	1,528	21.7	0.8
Diseases of musculoskeletal system and connective tissue	710-739	323	22.4	907	12.9	1.7
Congenital anomalties	740-759	4	0.3	7	0.1	2.8
Symptoms, signs, and ill-defined conditions	780-799	337	23.4	396	5.6	4.2
Injuries	800-999	915	63.5	3,959	56.1	1.1
Health services (physical exams, Pap smears, etc.)	V01-V99	1,141	79.1	1,877	26.6	3.0
Other and unspecified disorders		318	22.1	679	9.6	2.3
TOTAL		5,968	414.0	15,914	225.6	1.8

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Figure 1. Sick call visit rates per 1,000 person months according to category of illness and gender, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

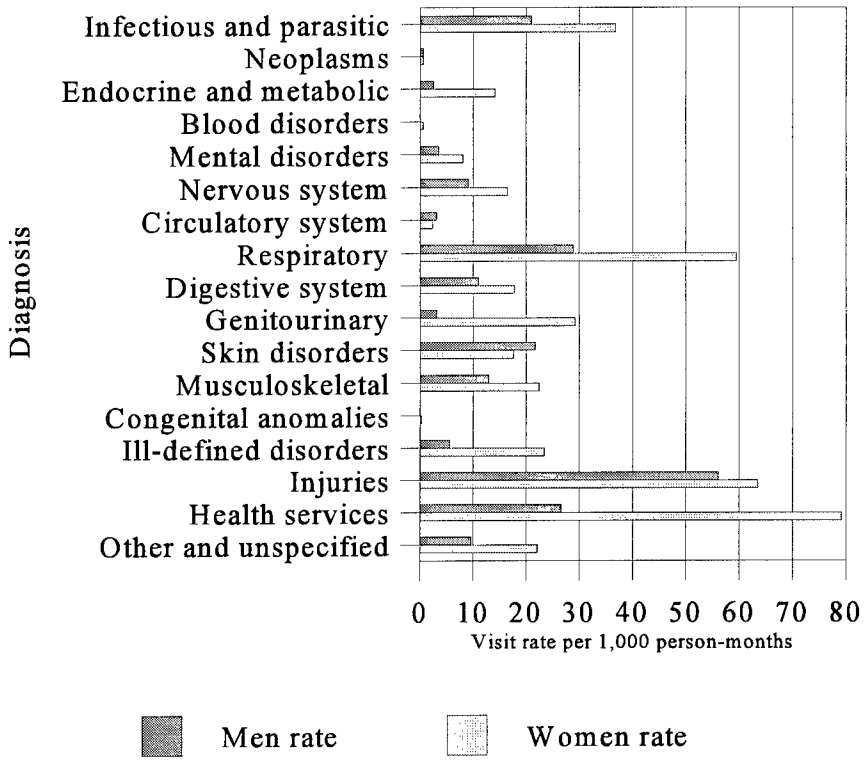
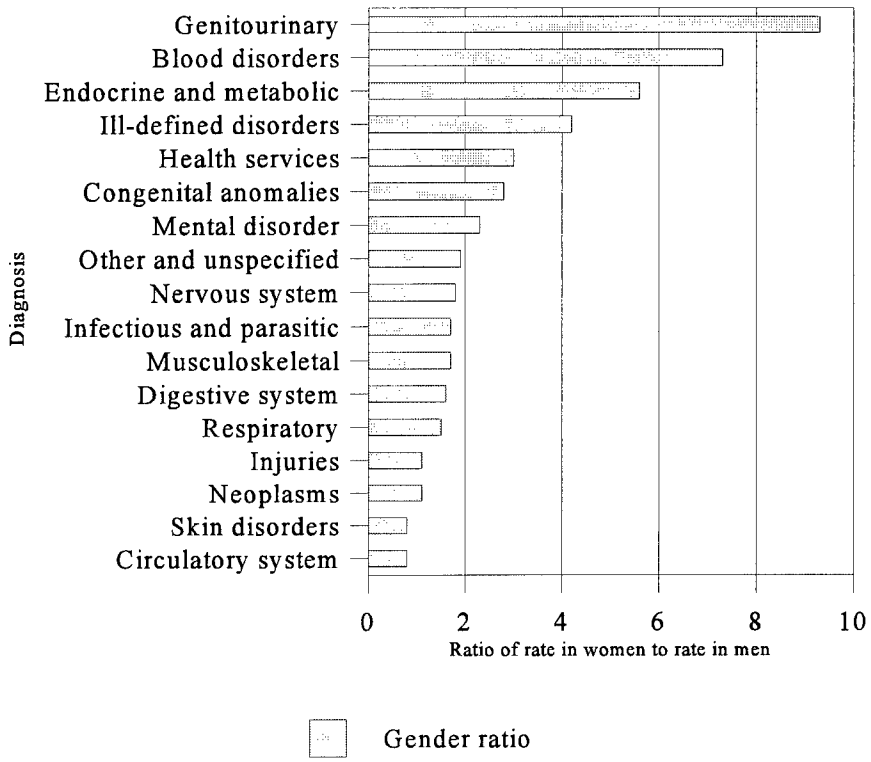


Figure 2. Percentage distribution of diagnoses associated with sick call visits, women, 32 U.S. Ships, 1995-1996, U.S. Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.



CONCLUSIONS

Most of the findings of this study were similar to those previously reported by Nice and Hilton [1, 2], based on a similar study design. The principal diagnoses accounting for sick call visits in both genders were injuries, although the most common reason for visits by women was for health services, a broad category that includes services provided when there is generally no present diagnosis of illness or injury. These services included general medical examinations, visits for contraceptive management and counseling, Papanicolaou smears, and visits associated with pregnancy testing and normal pregnancies. As previously reported, there were substantial differences in sick call visit rates between women and men, with the highest ratio of rates in women to those in men occurring for genitourinary disorders, blood disorders such as anemias (although these were uncommonly diagnosed in either gender), and endocrine and metabolic disorders, including weight control. Visit rates were higher in men than women for circulatory system and skin disorders. The overall ratio of sick call visits rates in women to those in men was 1.8, which was identical was identical to the ratio previously reported by Nice and Hilton [1,2].

Future analyses will expand the investigation to include additional ships and ship types, and will examine sick call visit rates according to more specific diagnostic categories (e.g., acute respiratory infections, urinary tract infections). Sick call visit rates also will be further examined according to type of ship, type of medical personnel aboard, occupational rating, time of visit, and other relevant characteristics.

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Appendix Table A-1. List of all ships submitting visit data for the sick call visit rate study, Navy Women Aboard Ship Study, 15 NOV 1994 - 31 JAN 1996.

		CREW		NUMBER OF SICK CALL VISITS			
SHIP NAME	HULL NUMBER	WOMEN	MEN	WOMEN	MEN	ENDING DATE	TYPE OF RECORD
Present Analysis							
USS ASHLAND	LSD-48	32	362	87	315	10/10/95	Log
USS JOHN BARRY	DDG-52	19	319	14	261	7/28/95	SAMS
USS CAMDEN	AOE-2	69	576	212	2,599	8/28/95	Log
USS COMSTOCK	LSD-45	37	298	141	1,054	6/19/95	SAMS
USS DETROIT	AOE-4	63	548	132	512	9/20/95	Log
USS EMORY S. LAND	AS-39	457	1,069	2,070	2,683	9/30/95	SAMS
USS GRASP	ARS-51	27	87	24	81	8/30/95	Log
USS HAYLER	DD-997	36	307	33	229	10/24/95	SAMS
USS JOHN YOUNG	DD-973	24	306	8	64	4/29/95	SAMS
USS KISKA	AE-35	75	321	246	457	9/8/95	Log
USS MAUNA KEA	AE-22	27	287	18	234	10/26/95	Log
USS MERRIMACK	AO-179	90	220	204	299	9/20/95	Log
USS MONONGAHELA	AO-178	97	195	420	471	6/30/95	SAMS
USS MOUNT HOOD	AE-29	96	329	289	578	9/6/95	Log
USS PLATTE	AO-186	85	183	465	697	11/12/95	SAMS
USS RAINIER	AOE-7	74	507	98	370	8/8/95	Log
USS RUSHMORE	LSD-47	1	342	5	1,264	1/6/95	SAMS
USS SACRAMENTO	AOE-1	68	549	601	2,474	12/11/95	SAMS
USS SAFEGUARD	ARS-50	25	78	22	18	5/9/95	SAMS
USS SALVOR	ARS-52	23	81	50	81	5/17/95	SAMS
USS SANTA BARBARA	AE-28	87	290	148	305	7/31/95	SAMS
USS SIMON LAKE	AS-33	338	793	659	624	9/29/95	Log
USS TORTUGA	LSD-46	26	26	22	244	10/19/95	Log
TOTAL		1,876	8,073	5,968	15,914		

		CREW		NUMBER OF SICK CALL VISITS			
SHIP NAME	HULL NUMBER	WOMEN	MEN	WOMEN	MEN	ENDING DATE	TYPE OF RECORD
Pending analysis:							
USS CAPE COD	AD-43	424	1,145	37	938	12/20/95	Log
USS DIXON	AS-37	397	981	156	292	12/20/95	SAMS
USS EISENHOWER	CVN-69	524	4,476	1,348	5,821	12/27/95	Log
USS FRANK CABLE	AS-40	308	923	3	4	11/2/95	SAMS
USS GRAPPLE	ARS-53	36	103	8	8	5/26/95	SAMS
USS HOLLAND	AS-32	360	1,021	107	127	7/31/95	Log
USS SHASTA	AE-33	72	340	584	1,775	7/10/95	SAMS
USS SHENANDOAH	AD-44	497	1,041	185	192	8/31/95	SAMS
USS SUPPLY	AOE-6	07	594	1	1	10/21/95	SAMS
TOTAL		2,625	10,624	2,429	9,158		
GRAND TOTAL		4,501	18,697	8,397	25,072		

APPENDIX G.14

USS DWIGHT D. EISENHOWER (CVN-69)

Frank C. Garland, Ph.D., D. Steven Nice, Ph.D., and Susan Hilton, M.A.

REPORT TOPIC AREA: USS DWIGHT D. EISENHOWER (CVN-69)

LEAD AUTHORS: Frank C. Garland, Ph.D., D. Steven Nice, Ph.D., and Susan Hilton, M.A.

ABSTRACT

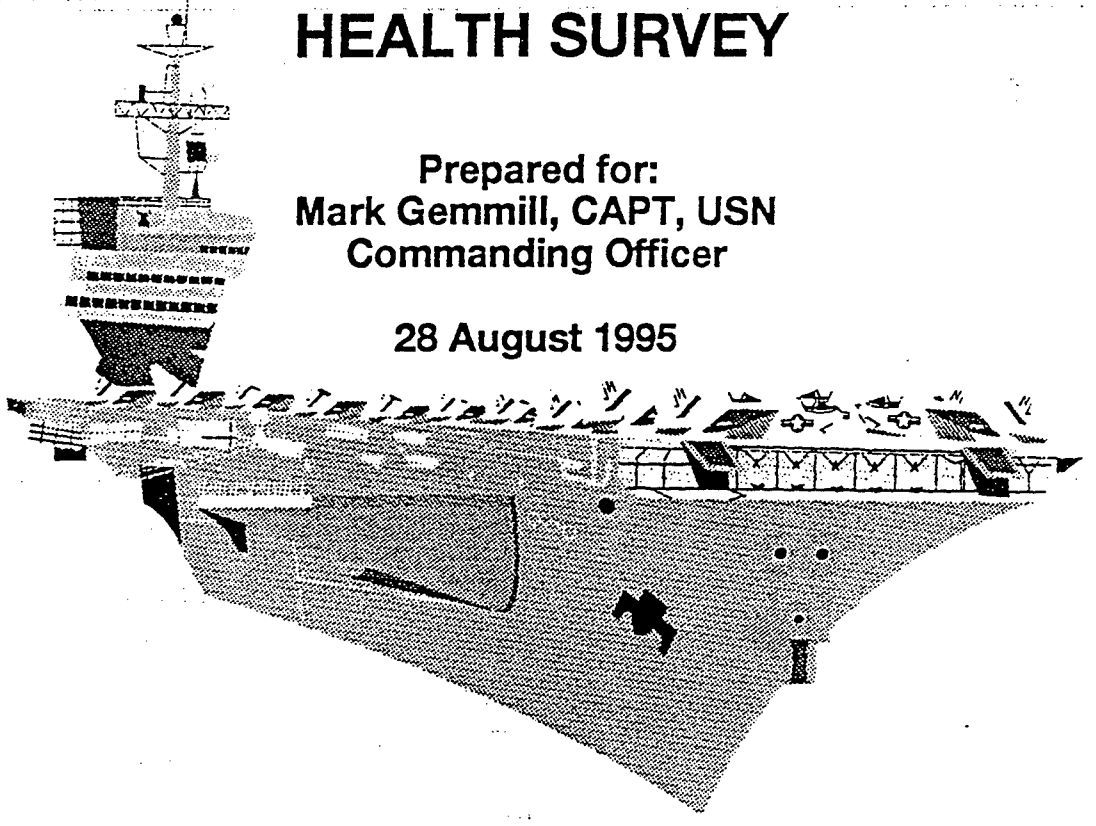
USS DWIGHT D. EISENHOWER was the first combatant ship in the Navy to deploy with women aboard, and was included during February-March 1995 as the first ship to participate in the U.S. Navy Women Aboard Ship Study. Self-administered questionnaires were completed by 82% (N=187) of women aboard and a sample of men (N=187) matched to the women on work division, department, race, pay grade, occupational rating, and date of birth. Women and men aboard ship reported similar and relatively high levels of satisfaction with their quality of life. General shipboard stress was higher in women in junior pay grades than those in senior pay grades. Women in lower pay grades reported more career stress than those in higher pay grades. There were no differences in personal stress by pay grade or gender, although depressive symptoms were more common in lower pay grades than in higher pay grades. Depression was reported by approximately 10% of women and 8% of men at the beginning of deployment, and did not increase during deployment. Menstrual disorders were reported by 8% of women at the beginning of deployment, and increased to 16% during deployment. Half the women aboard experienced symptoms characteristic of premenstrual syndrome during the past 90 days, and 16% reported that they lost two or more hours of work during the past 30 days due to menstrual conditions. The most commonly reported occupational exposures in both genders were to noise, lifting heavy objects, and paint. When asked about the likelihood of pregnancy, approximately 10% of women reported that they had a 75-100% probability of becoming pregnant during the next 12 months and 73% reported zero probability of becoming pregnant during the next 12 months. Crew members reported that they generally felt comfortable seeking birth control information from the medical department. Interviews with medical department staff indicated that 55% reported a need for more gynecological training, 36% reported a need for additional supplies for birth control, and 45% reported a need for more private space for examinations.

USS DWIGHT D. EISENHOWER (CVN-69)

PRELIMINARY REPORT ON THE WOMEN ABOARD SHIP HEALTH SURVEY

Prepared for:
Mark Gemmill, CAPT, USN
Commanding Officer

28 August 1995



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Executive Summary

Background

This project was carried out under the Defense Women's Health Research Program at the Naval Health Research Center (NHRC). USS DWIGHT D. EISENHOWER (CVN-69) was the first combatant ship in the U.S. Navy to deploy with women aboard. It was included as the first ship in the Women Aboard Navy Ships: A Comprehensive Health and Readiness Research Project. NHRC survey personnel (LCDR Lisa Meyer, MC, USN, and LT Michael Schwerin, MSC, USN) arrived aboard ship on 12 Feb 95 and departed by 22 Mar 95.

Approach

Two data collection methods were used in this project: (1) a self-administered survey, and (2) a structured interview of medical department staff. All women in the ship's crew were considered eligible for inclusion in the study and were asked to volunteer; Air squadrons and Air wings were not asked to participate. For each woman who volunteered, a man matching on the following criteria also was asked to participate: work division, department, age (± two years), race, pay grade, and job rating (exact or closely related rating). Volunteers were brought together, briefed on the study, read and signed informed consent statements, and completed the surveys while NHRC staff were present. Data on sick call visits were collected by use of special logs in sick call; these are currently being analyzed and results are not presented in this report.

Results

The following results are preliminary and reflect a first-cut on the data. The participation rate was high: 81.7% of women in the crew participated. Any differences that were highlighted in this report were statistically significant. The major findings by topic area were:

Stress and Quality of Life:

- There were no differences in reported quality of life by gender.
- Paygrade was positively associated with reported quality of life on all dimensions such that higher paygrades reported higher quality of life.

- Among women, general shipboard stress was inversely related to paygrade such that junior women reported more general shipbaord stress than senior women.
- There were no differences in workgroup stress by paygrade or gender.
- Among women, Navy career stress was inversely associated with paygrade, such that lower paygrades reported more stress.
- Among men, Navy career stress was positively associated with paygrade, such that higher paygrades reported more stress.
- Paygrade was inversely associated with family/personal relationship stress for both women and men.
- There were no differences in personal stress by paygrade or gender.
- Enlisted women reported more depressive symptoms than enlisted men.
- Paygrade was inversely associated with reported depressive symptoms.

Occupational Exposures:
- The most commonly reported occupational exposures were loud noises, lifting, and paint.
- Men were significantly more exposed than women to lifting, jet exhaust, and jet fuel.

Self-reported Medical Conditions:
- Approximately 60% of men and women reported that they were not medically screened prior to deployment.
- Depression was the most commonly reported condition at the time of deployment, but did not increase during deployment.
- Menstrual disorders were common and increased during deployment.
- 50% of women reported PMS.
- 16.5% of women reported 2 or more hours of work lost during the past 30 days due to menstrual problems.
- Less than 3% of women reported a day or more of work lost during the past 30 days due to menstrual problems.

Patient Satisfaction:
- There were no differences in patient satisfaction by paygrade or gender.

Pregnancy and Family Planning:

- 60% of junior enlisted women have had no lifetime pregnancies, compared to 30% of senior enlisted women.
- 68% of women officers have had no lifetime pregnancies.
- Marital status was not associated with self-reported likelihood of pregnancy during the next 12 months.
- 73% of women reported zero probability of becoming pregnant in the next 12 months.
- Approximately 10% reported 75-100% probability of becoming pregnant in the next 12 months.
- Crew members generally support the use of birth control and feel comfortable seeking birth control information from the doctor.

Medical Department Interviews:

- 55% of Medical Department staff reported a need for more gynecological training.
- 36% reported a need for additional supplies for pregnancy prevention.
- 45% reported a need for more private space for examinations.

Conclusions

Women and men aboard ship reported similar and relatively high levels of satisfaction with their quality of life. General shipboard stress among women was negatively associated with paygrade, such that more junior women reported greater stress. Navy career stress was also negatively associated with paygrade among women, but positively associated with paygrade among men. Family/personal stress did not differ by gender, but was negatively associated with paygrade. There were no significant gender or paygrade effects on workgroup or personal stress. Enlisted women reported higher levels of depressive symptoms than enlisted men or women officers. Women and men generally reported equal occupational exposures, except for lifting and exposure to jet fuel and exhaust, which were more commonly reported by men.

Menstrual disorders were common and increased during deployment. 16.5% of women reported loss of two or more hours per month from work due to these causes, but only 3% reported losing a day or more per month. There were no gender or paygrade differences in overall satisfaction with medical care aboard ship.

Nearly three-quarters of women reported zero probability of becoming pregnant in the next twelve months, while 10% expect to become pregnant. Negative attitudes about birth control or discomfort in discussing birth control with medical personnel were not important barriers to using birth control. Most agree that it is important to use birth control and do not feel that it is inconvenient. Medical department personnel report that more gynecological training would be useful, as would more birth control supplies.

Demographics

PRELIMINARY REPORT

NOT APPROVED FOR PUBLIC RELEASE:
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Demographic Summary

Women aboard (ship's company) = 229
Women surveyed = 187 (81.7%)
Men surveyed = 170
Total surveyed = 357

Race

	N	%
White	218	63.9
Black	91	26.7
Hispanic	22	6.5
Asian	5	1.5
Nat. Am.	5	1.5
Total*	357	100.0

Paygrade

	N	%
E-1	12	3.4
E-2	38	10.9
E-3	41	11.7
E-4	67	19.1
E-5	69	19.7
E-6	59	16.9
E-7	24	6.9
E-8/9	14	4.0
O-1	3	0.9
O-2	3	0.9
O-3	14	4.0
O-4/5	6	1.7
Total*	357	100.0

Age in years (Mean = 28.8)

	N	%
17-19	31	9.0
20-24	102	29.5
25-29	66	19.1
30-34	72	20.8
35-39	56	16.2
40-44	15	4.3
45+	4	1.2
Total*	357	100.0

*Totals include missing data

PRELIMINARY REPORT

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Demographic Summary

Marital Status

	Women		Men	
	N	%	N	%
Married	83	63.9	101	59.0
Single	74	26.7	64	37.5
Widowed	3	6.4	0	0.0
Divorced	16	1.4	6	3.5
Separated	3	1.6	0	0.0
Total*	187	100.0	170	100.0

Average Shipboard Experience

	Women	Men
Avg. no. of years aboard ship	1.1	3.6
Range, years	(0 - 11)	(0 - 14)
Avg. no. of previous deployments	1.6	3.7
Range, deployments	(0 - 10)	(0 - 30)

*Totals include missing data.

Quality of Life and Stress

PRELIMINARY REPORT

NOT APPROVED FOR PUBLIC RELEASE:
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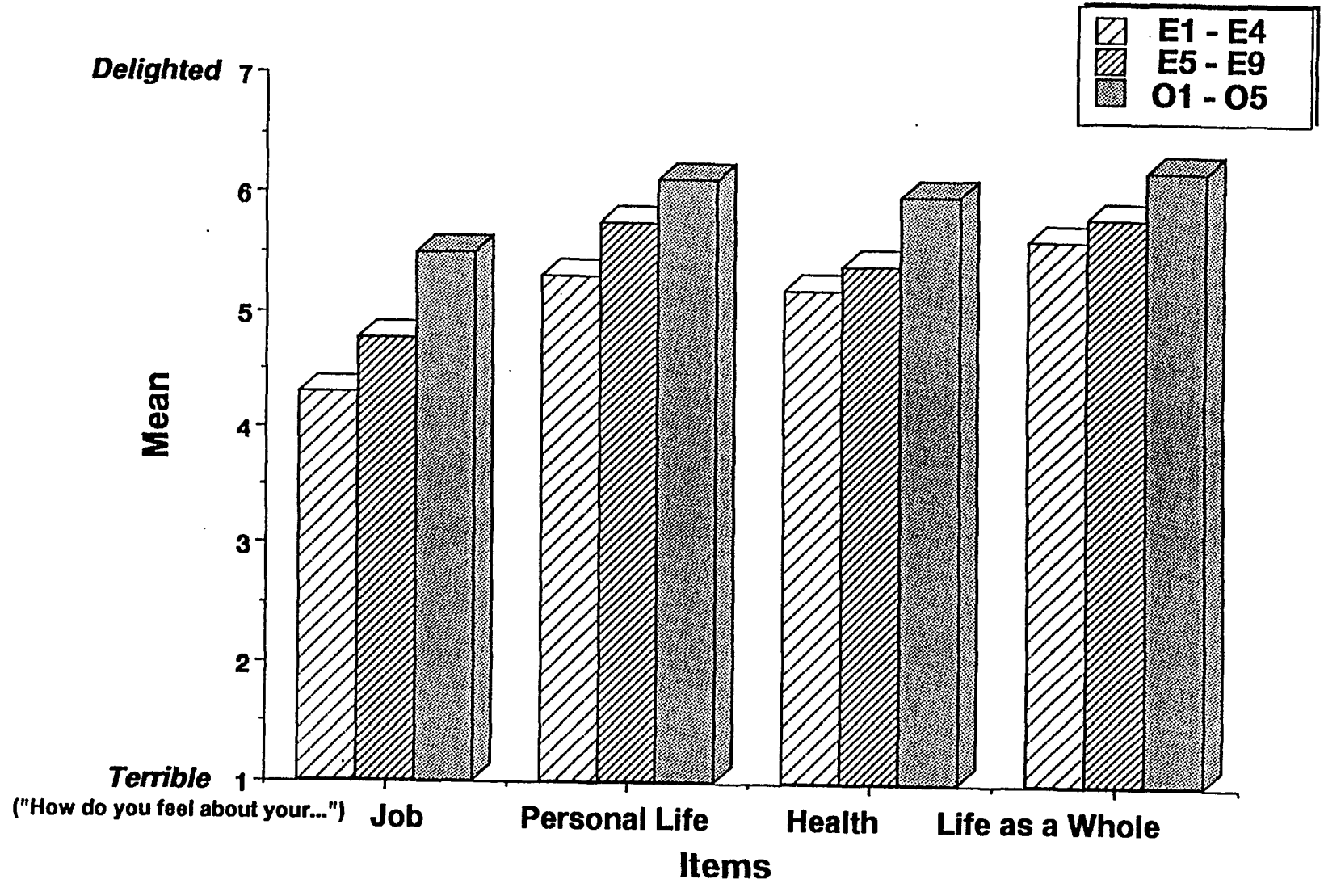
Quality of Life by Paygrade



Findings: Paygrade was positively associated with quality of life on all dimensions.

Patient Satisfaction

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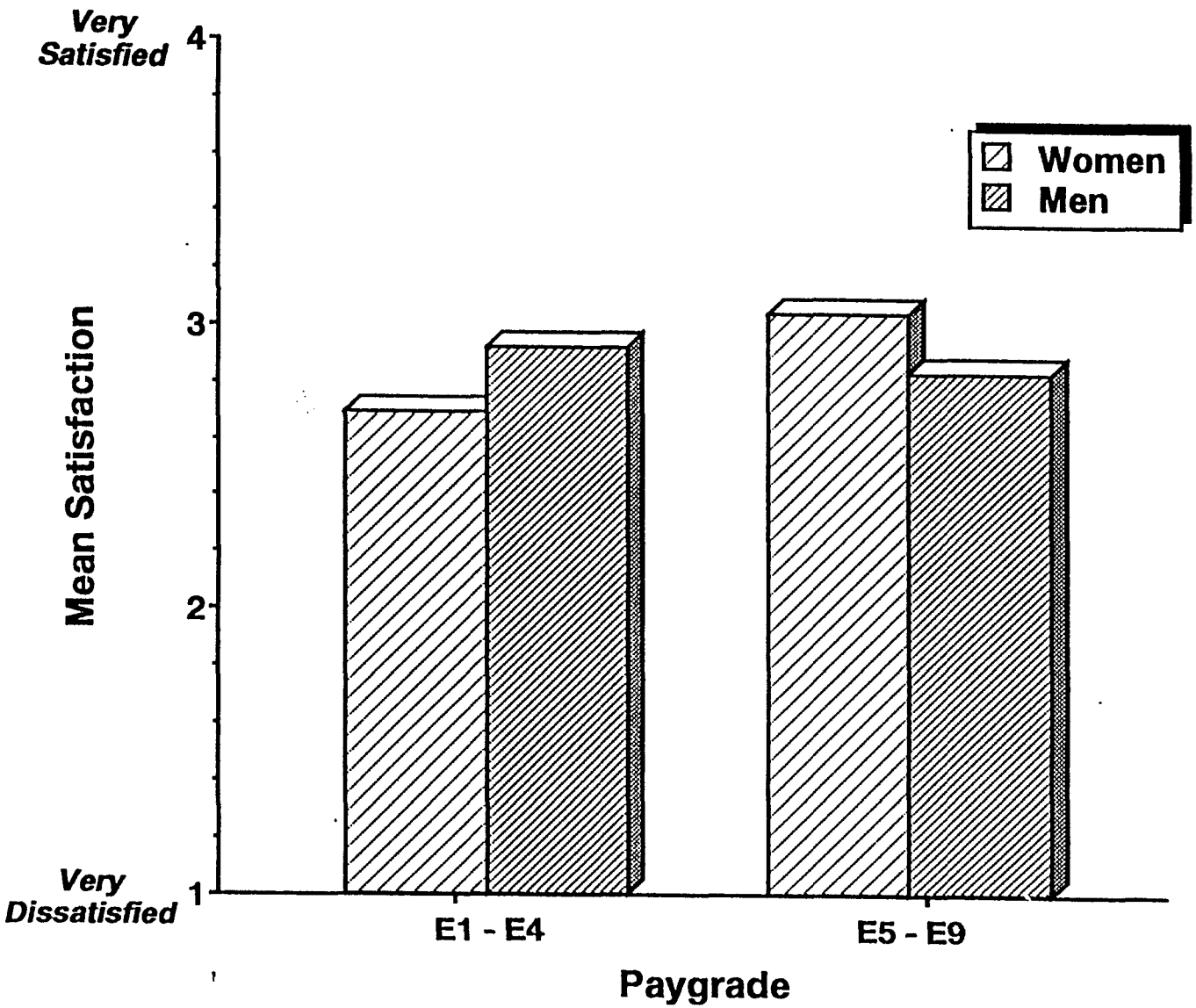
PRELIMINARY REPORT

Patient Satisfaction with Sick Call



Findings: No significant differences by paygrade or gender.

Note: Number of officers insufficient for analysis.

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PRELIMINARY REPORT
G-292
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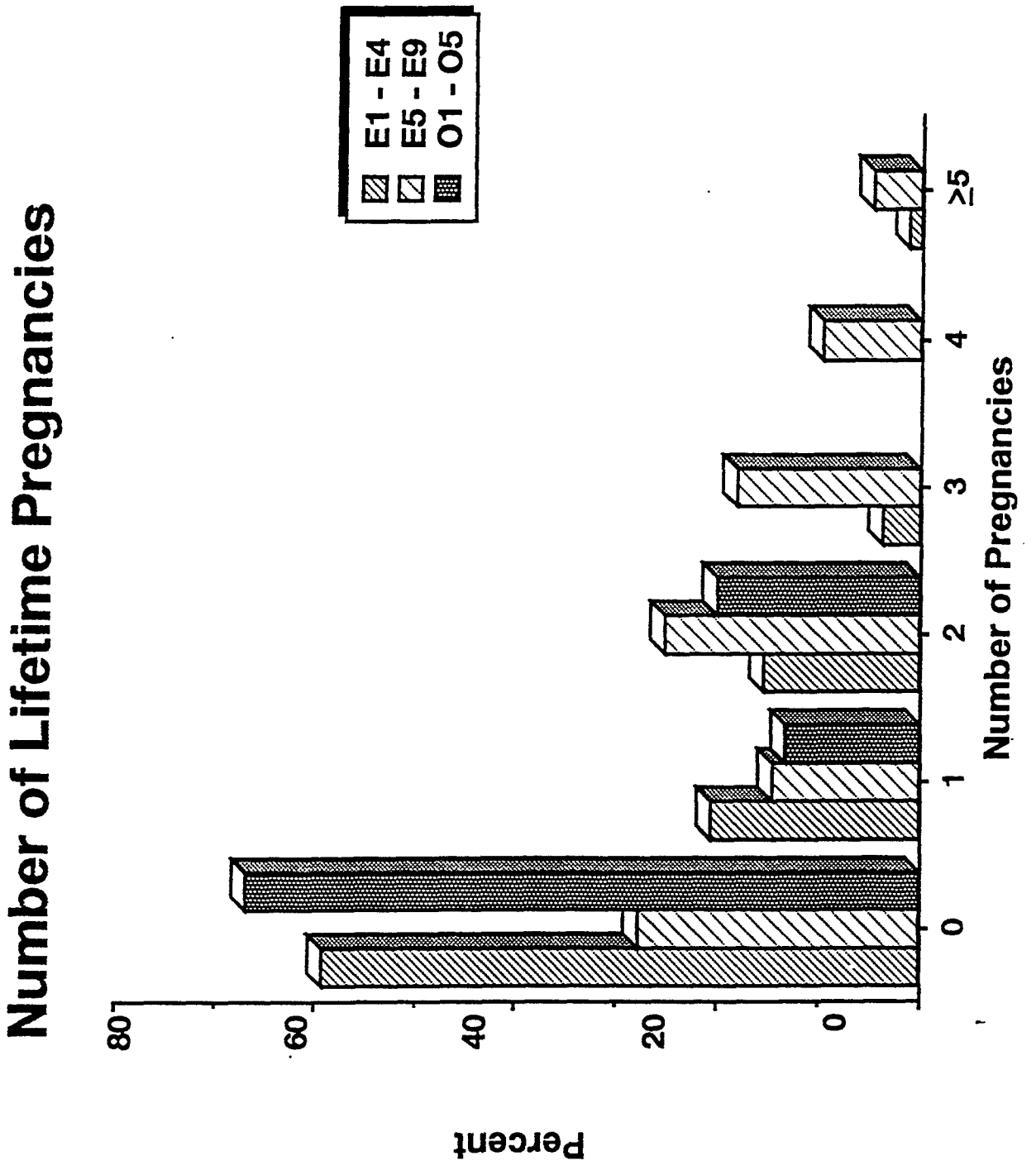
Pregnancy and Family Planning


Number of Lifetime Pregnancies
E1 - E4
E5 - E9
O1 - O5
Percent
80
60
40
20
0
0
1
2
3
4
≥5
Number of Pregnancies

PRELIMINARY REPORT

G-294

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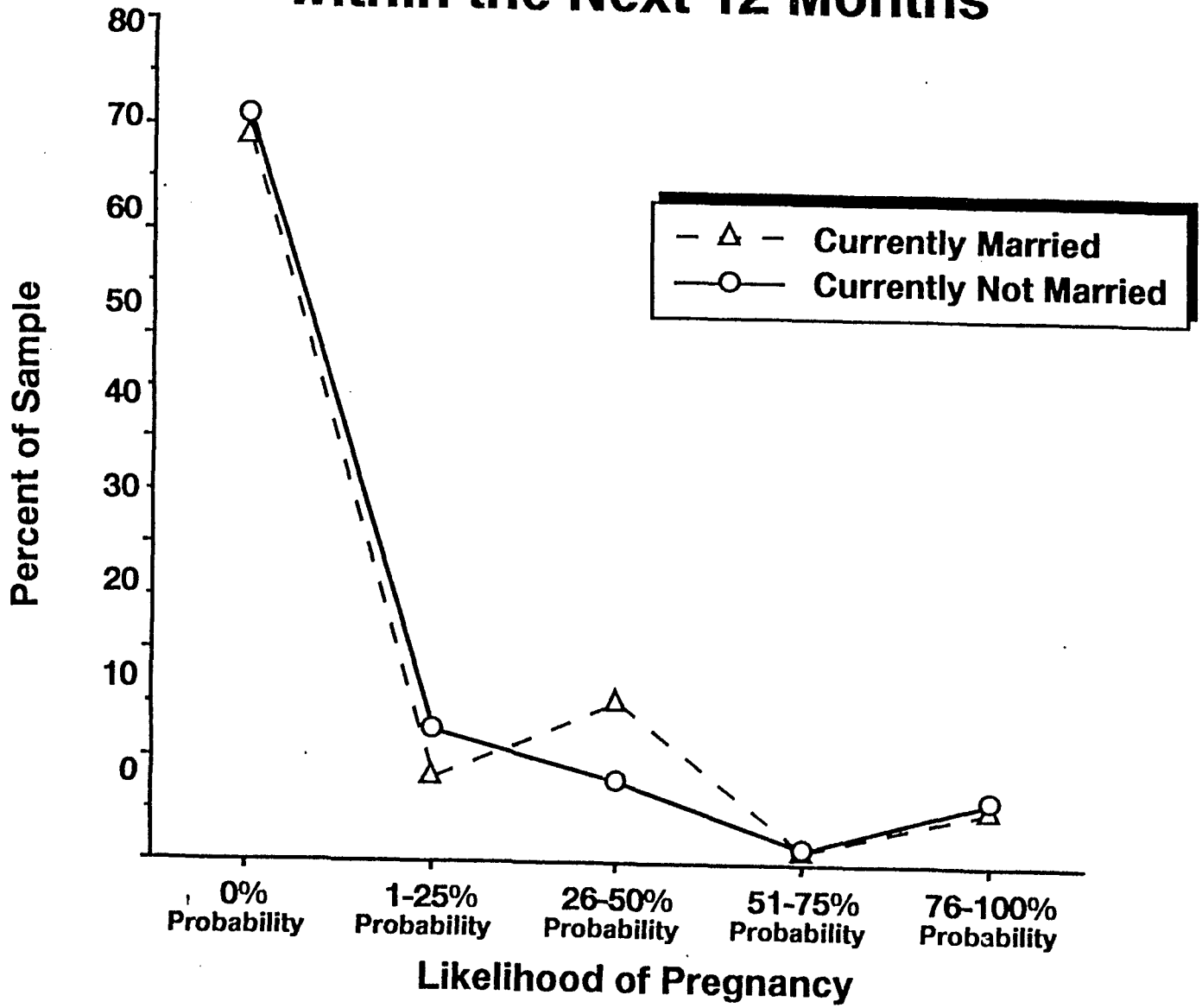
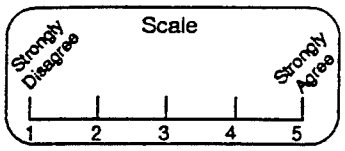
Likelihood of Becoming Pregnant within the Next 12 Months





Family Planning

	Mean Scores							
	E1 - E4		E5 - E9		O1 - O5		All	
	Women	Men	Women	Men	Women	Men	Women	Men
1. The whole idea of birth control is embarrassing to me.	1.70	1.85	1.39	1.82	1.64	2.00	1.54	1.85
2. I think it is very important to use birth control after marriage until you start a family.	3.94	3.83	4.00	3.91	4.45	3.86	4.02	3.87
3. I could not have sexual intercourse without using birth control.	3.64	3.11	3.68	3.43	4.36	3.71	3.72	3.30
4. I would have sexual intercourse without using birth control if my partner wanted me to.	2.20	2.91	2.00	3.09	1.36	2.14	2.03	2.95
5. Sometimes when a birth control method is not available, I believe you just have to take a chance and hope for good luck to avoid causing a pregnancy.	1.85	2.02	1.53	1.95	1.36	1.57	1.66	1.96
6. If I need to go to the doctor or clinic for birth control information, I would feel comfortable about it.	4.15	3.72	4.31	3.82	3.55	3.29	4.17	3.74
[Women Only]								
7. I hope to become pregnant during the next 12 months.	2.17	–	1.72	–	1.09	–	1.87	–
8. I probably will become pregnant during the next 12 months.	2.03	–	1.54	–	1.09	–	1.73	–
9. My partner objects to the use of birth control measures.	1.80	–	1.72	–	1.50	–	1.74	–
10. Using birth control is inconvenient.	1.73	–	1.70	–	1.91	–	1.73	–
11. I would not use birth control pills because I am concerned about possible health effects.	2.38	–	2.05	–	2.09	–	2.20	–
12. A sexual active woman who uses an intrauterine device (IUD) is not very likely to become pregnant.	2.67	–	2.70	–	2.82	–	2.69	–
13. A sexual active woman who uses a diaphragm and contraceptive gel is not very likely to become pregnant.	2.90	–	2.58	–	2.82	–	2.75	–
14. A sexually active woman whose partner always uses a condom is not very likely to become pregnant.	2.93	–	2.57	–	2.45	–	2.73	–

Medical Department Interviews

PRELIMINARY REPORT
G-296
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PRELIMINARY REPORT

Major Health Care Issues

What do you think are the major issues facing the Medical Department regarding women's health care needs aboard ship?

	N	%
Need additional gynecological training	6	54.5
Need additional medical equipment	3	27.2
AMAL inadequate: Need more types of birth control methods, STD/pregnancy test kits	2	18.2

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Responses to Interview Questions

Question	% Responding: Yes	No	N/A
Do you have adequate supplies for pregnancy testing?	64	18	18
Do you have adequate supplies for pregnancy prevention?	55	36	9
Have you encountered the need for any additional items or medical equipment not found on your AMAL?	64	36	0
Does the layout of the medical spaces permit you to adequately deal with the need for privacy during examinations?	55	45	0
Do you feel your training has adequately prepared you to perform gynecological exams and treat common disorders related to women's health?	45	36	18

Pre-Deployment Medical Screening

Were you medically screened preceding this deployment?

	Women		Men	
	N	%	N	%
Yes	71	40.6	57	34.8
No	104	59.4	107	65.2
Total	187	100.0	170	100.0

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PRELIMINARY REPORT

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Medical Department's Recommendations

Do you have any recommendations for changes regarding staffing to complement the Medical Department?

	N	%
Keep male/female provider balance	6	54.5
Add trained GYN health care provider	2	18.2
Improve teamwork	1	9.1
Add clinical psychologist	1	9.1

PRELIMINARY REPORT
G-301
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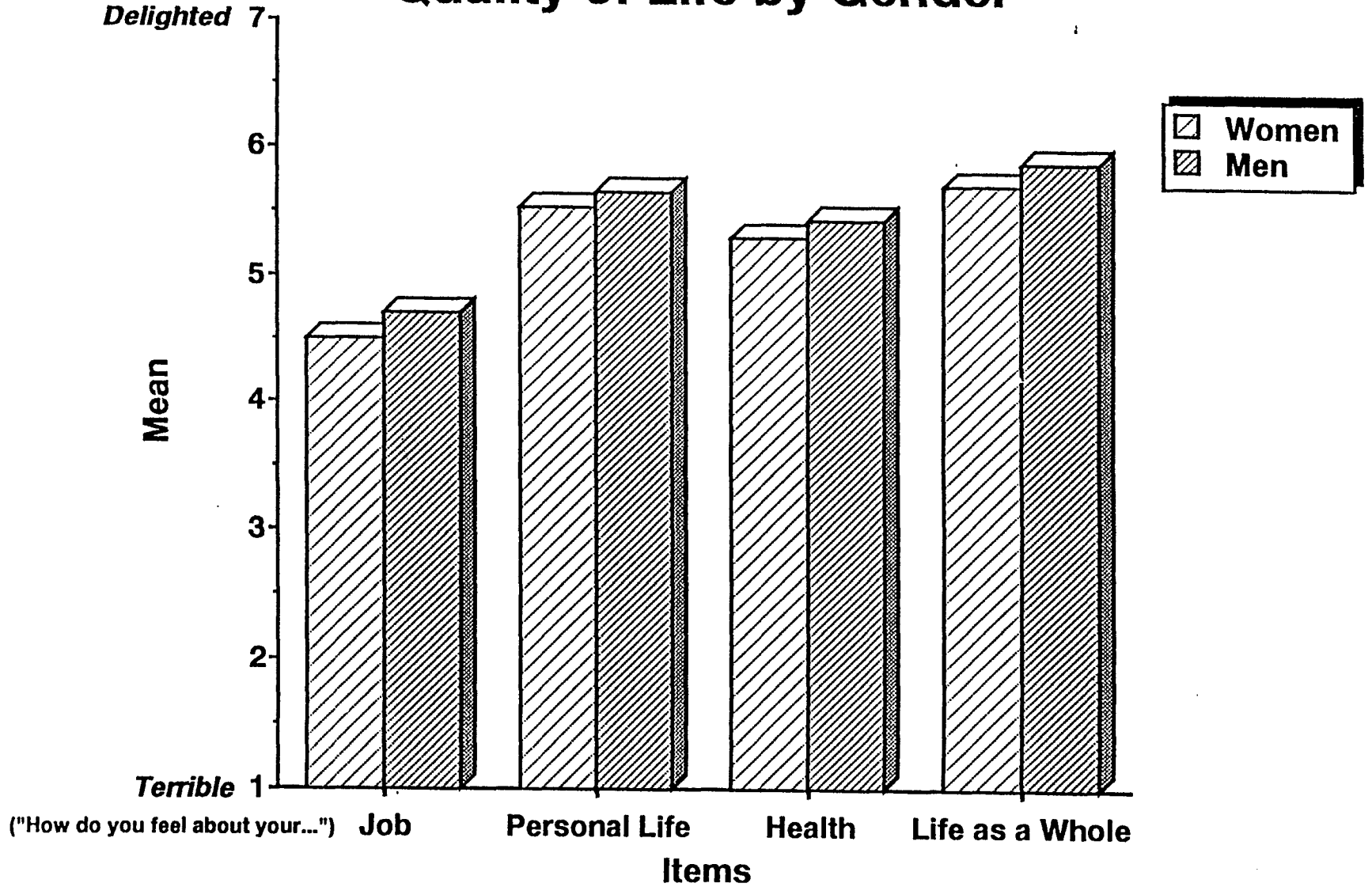
Quality of Life by Gender



Findings: No significant differences by gender.

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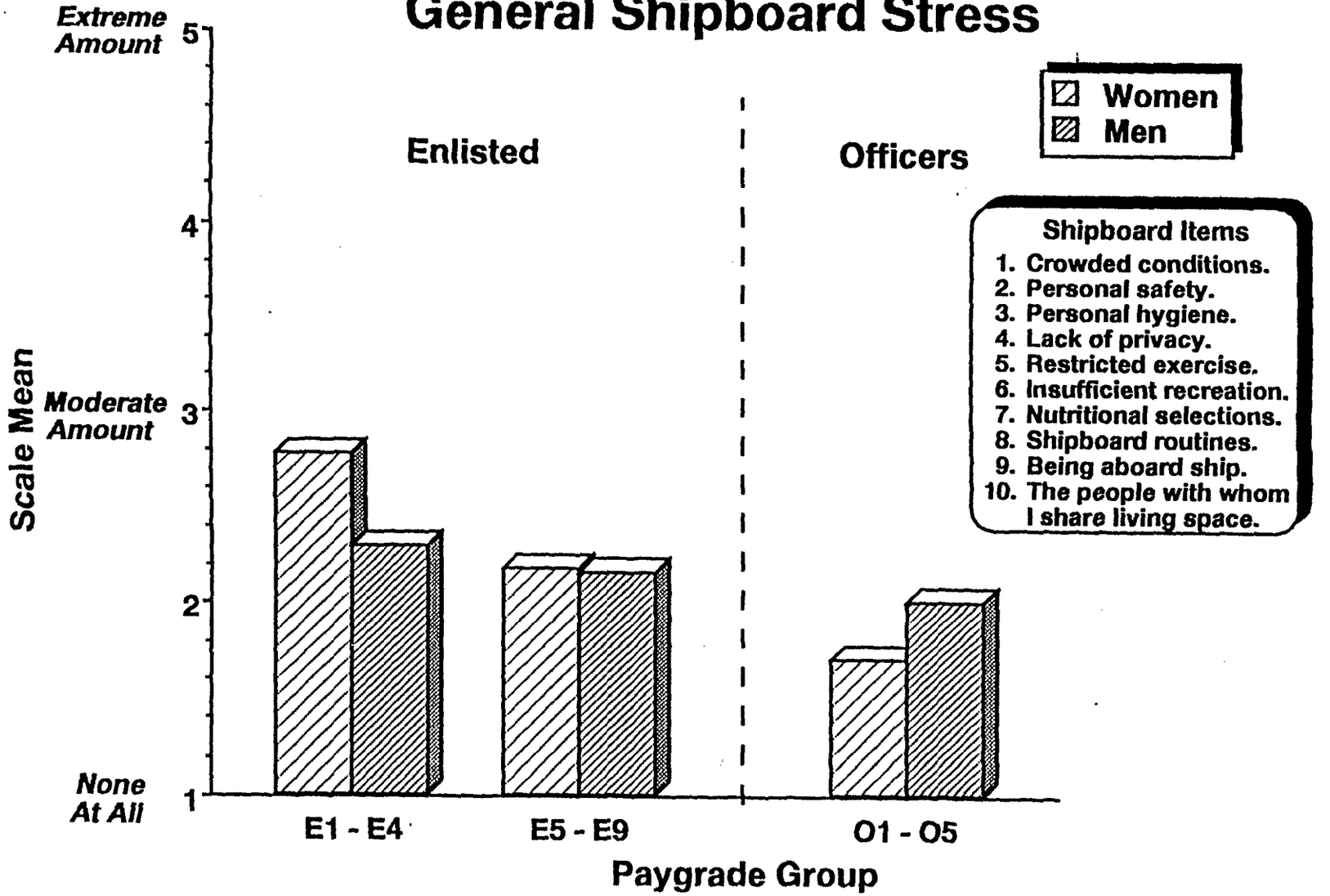
DO NOT QUOTE

General Shipboard Stress



Findings: Among women, general shipboard stress was negatively associated with rank/paygrade.
This was not the case among men.

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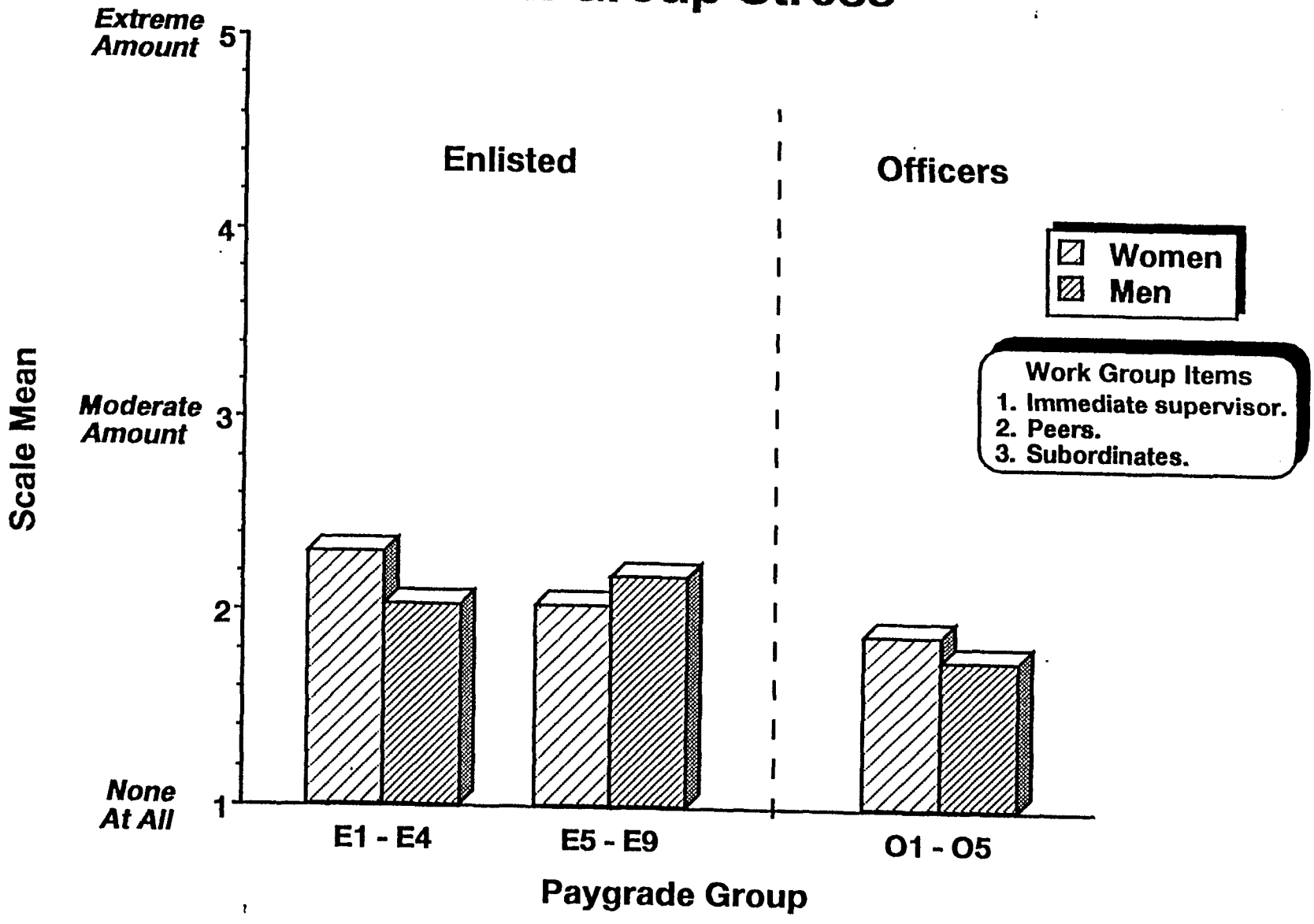
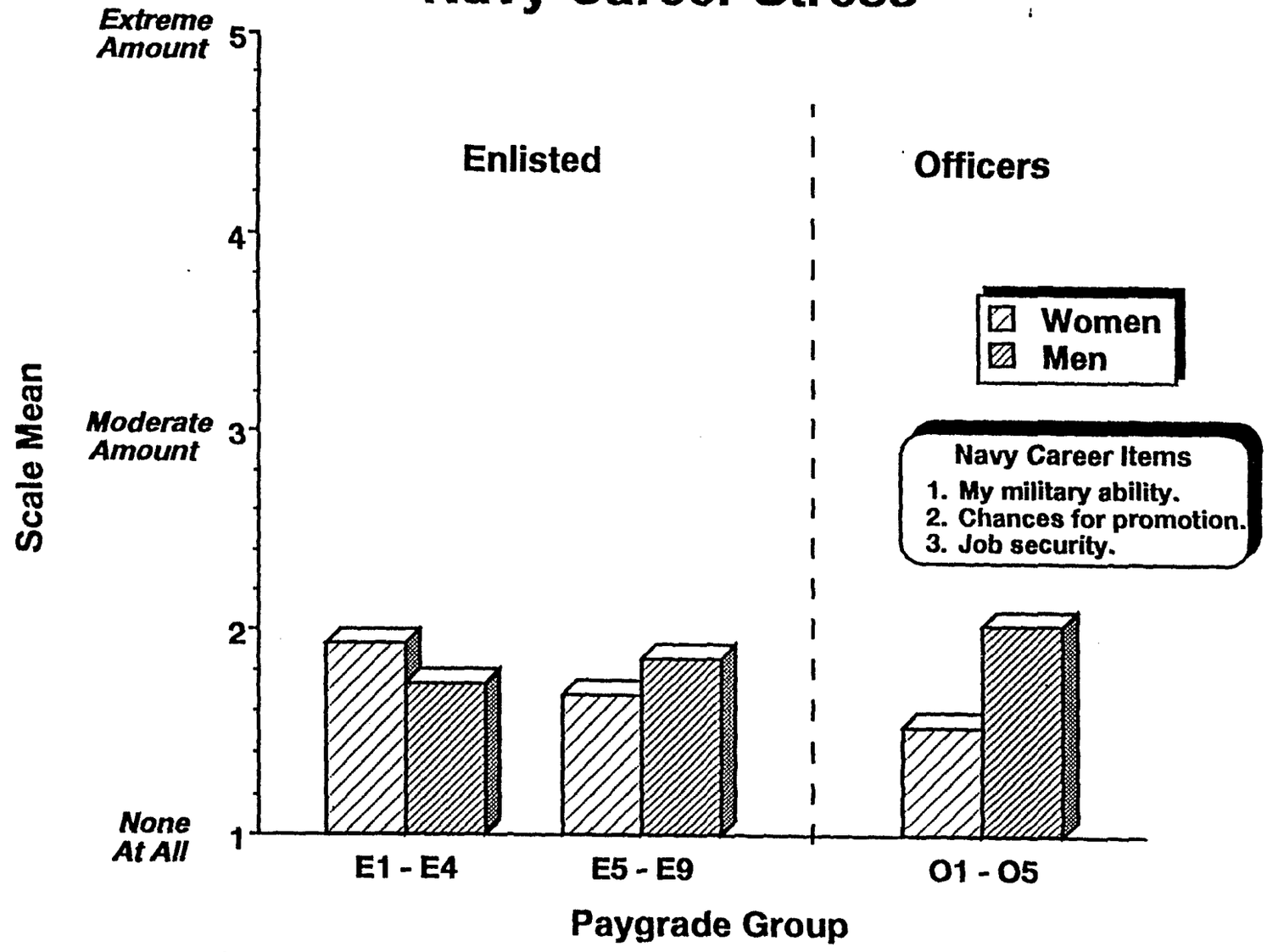
Work Group Stress



Findings: No significant differences.

Navy Career Stress



Findings: Among women, stress was inversely associated with paygrade.
Among men, stress was positively associated with paygrade.

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PRELIMINARY REPORT

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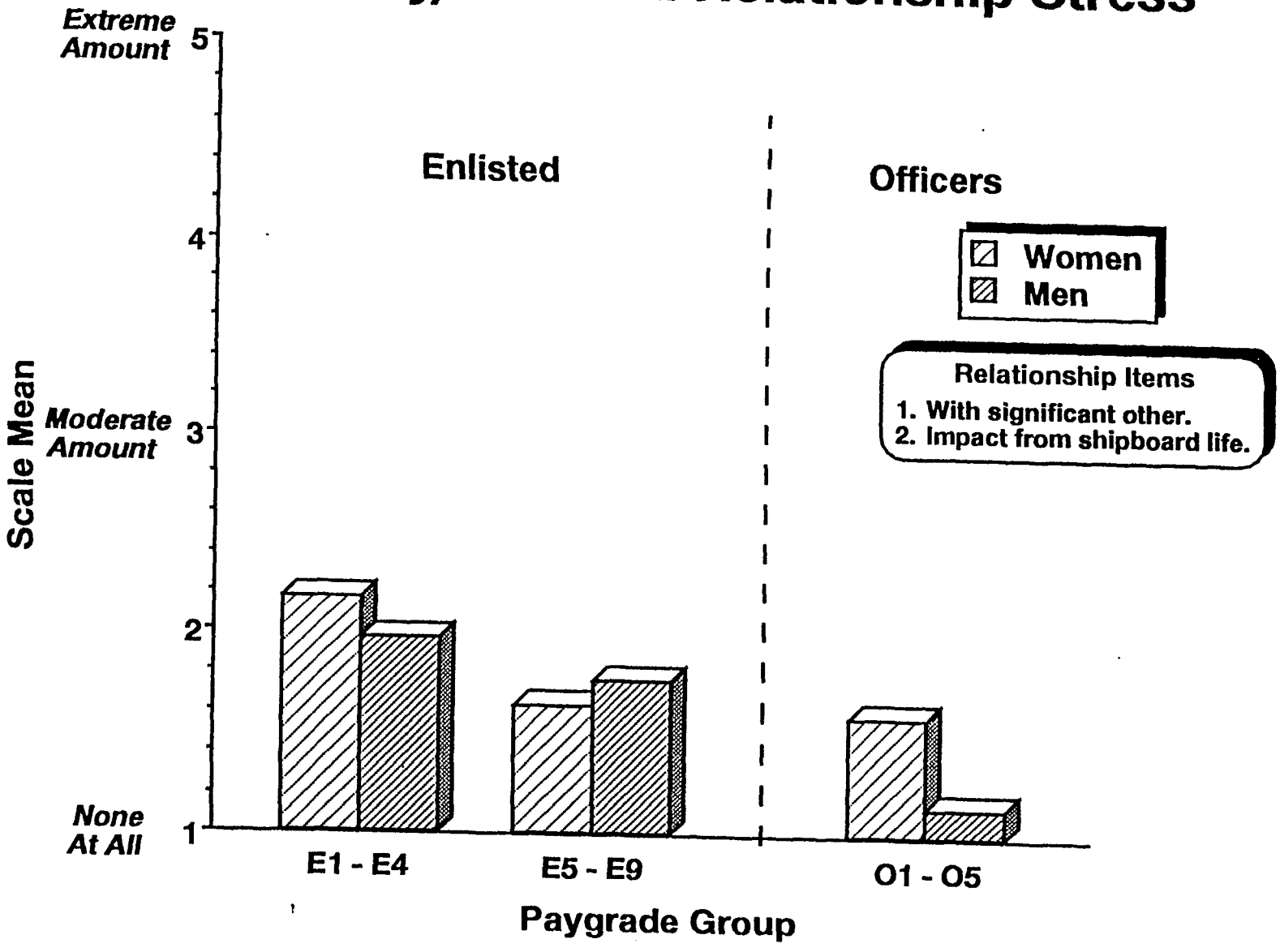
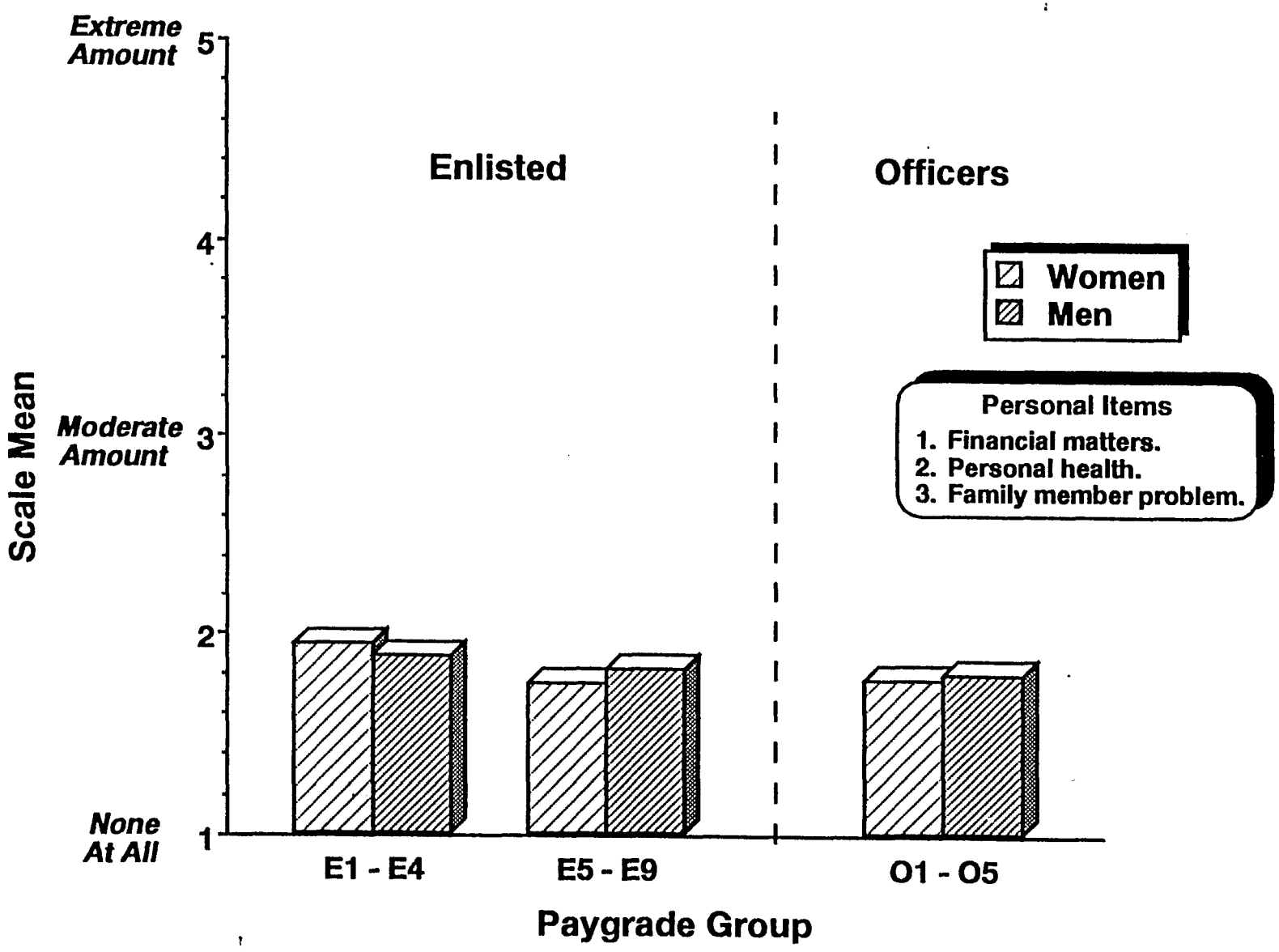
Family/Personal Relationship Stress



Findings: Paygrade was inversely associated with stress.

Personal Stress



Findings: No significant differences.

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PRELIMINARY REPORT

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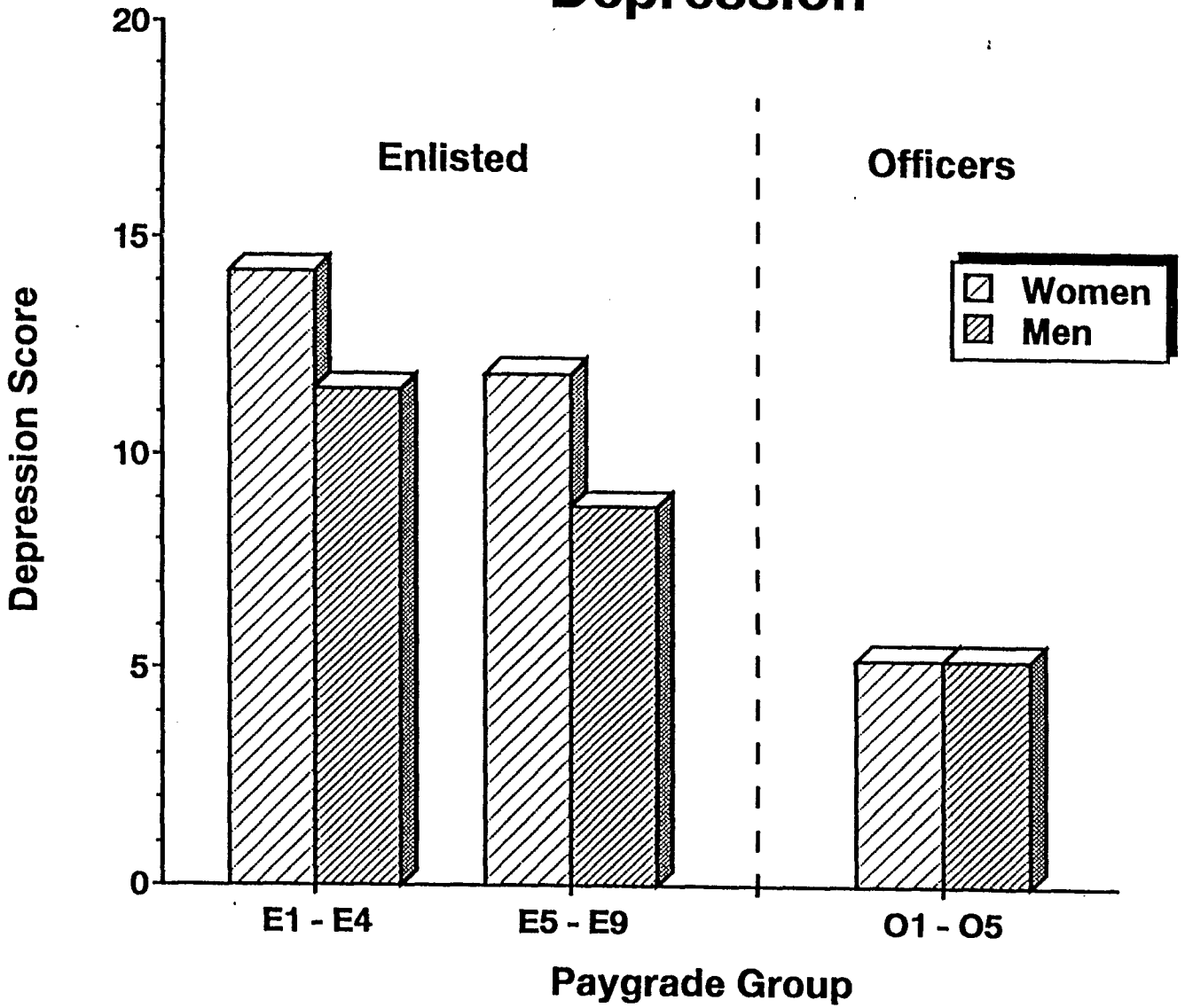
Depression



Findings: Enlisted women reported more depressive symptoms than enlisted men. Paygrade was inversely associated with reported depressive symptoms.

Occupational Exposures

PRELIMINARY REPORT
G-308
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PRELIMINARY REPORT

G-309

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Self-Reported Occupational Exposures

	Women		Men		
Exposure	% exposed	Hrs/wk	% exposed	Hrs/wk	
Loud noise	77.7	12.3	78.7	13.1	
Lifting 25-49 lbs	54.2	6.3	62.1	5.7	*
Paint, oil-based	38.5	9.0	40.2	6.6	
Paint, unknown type	30.2	6.1	27.8	8.1	
Lifting 50+ lbs	29.1	5.7	50.3	5.1	*
Paint scrapings	24.0	5.4	29.6	5.8	
Jet fuel	21.8	10.1	32.5	11.2	*
Diesel exhaust	20.7	7.5	29.0	13.0	
Jet exhaust	20.1	10.4	34.9	9.2	*
High temp (above 95°F)	19.6	8.6	19.5	10.2	
Gasoline	19.0	10.6	16.0	6.0	
Solvents	18.4	7.2	24.3	4.3	
Adhesives	17.9	3.8	22.5	3.3	
Low temperature (below 32°F)	16.2	18.9	14.8	11.1	
Carbon monoxide	16.2	9.9	17.2	7.5	

*Statistically significant

Self-Reported Medical Conditions

Pre-Deployment Medical Screening

Were you medically screened preceding this deployment?

	Women		Men	
	N	%	N	%
Yes	71	40.6	57	34.8
No	104	59.4	107	65.2
Total	187	100.0	170	100.0

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PRELIMINARY REPORT

Self-Reported Selected Medical Conditions Whether or Not Condition Resulted in Visit to Sick Call

Condition	Did you have this condition on the day of deployment? Women (N = 187) N	%	Men (N = 170) N	%	Do you have this condition now? Women (N = 187) N	%	Men (N = 170) N	%
Depression	19	10.2	13	7.6	22	11.8	8	4.7
Menstrual disorders	15	8.0	–	–	29	15.5	–	–
Flu	7	3.7	4	2.4	10	5.3	7	4.1
Pelvic inflammatory disease	5	2.7	–	–	1	0.5	–	–
Diarrhea lasting ≥ 3 days	4	2.1	4	2.4	6	3.2	6	3.5
Psychological condition, other	2	1.1	0	–	4	2.2	0	–
Gonorrhea	1	0.5	0	–	0	–	0	–
Anorexia or bulimia	1	0.5	0	–	0	–	0	–

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PRELIMINARY REPORT

Self-Reported Female-Specific Conditions
Whether or Not Condition Resulted in Visit to Sick Call

Did you have this condition in the past 30 days?

	N	%
Premenstrual symptoms or pain	39	50.0
Heavy periods	26	33.3
Missed periods	11	14.1
Excessive frequency of periods	9	11.5
Periods lasting longer than 1 week	9	11.5
Other symptoms related to menstrual period	5	6.4
Irregular menstrual periods other than above	4	5.1

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DEPARTMENT OF THE ARMY
US ARMY MEDICAL RESEARCH AND MATERIEL COMMAND
504 SCOTT STREET
FORT DETRICK, MARYLAND 21702-5012

REPLY TO
ATTENTION OF:

MCMR-RMI-S (70-1y) 9 Mar 98

MEMORANDUM FOR Administrator, Defense Technical Information Center, ATTN: DTIC-OCP, Fort Belvoir, VA 22060-6218

SUBJECT: Request Change in Distribution Statement

1. The U.S. Army Medical Research and Materiel Command has reexamined the need for the limitation assigned to technical reports written for the following contracts. Request the limited distribution statement for these contracts be changed to "Approved for public release; distribution unlimited." These reports should be released to the National Technical Information Service.

Contract Number	Accession Document Number
DAMD17-94-J-4407	ADB224557
DAMD17-95-1-5048	ADB230013
DAMD17-95-C-5006	ADB219041
95MM5508	ADB227588
95MM5522	ADB229897
95MM5537	ADB227721
95MM5596	ADB229924
96MM6652	ADB220033
96MM6653	ADB221466
96MM6654	ADB222409

2. Point of contact for this request is Ms. Betty Nelson at DSN 343-7328 or email: betty_nelson@ftdetrck-ccmail.army.mil.

FOR THE COMMANDER:

Phyllis Rinehart

PHYLIS M. RINEHART
Deputy Chief of Staff for
Information Management

completed
2-8-2000
BW